

Ambarella

Growth resumes in CY24E, yet visibility and negative EPS limit outlook

Reiterate Rating: UNDERPERFORM | PO: 62.00 USD | Price: 57.96 USD

FY25 topline growth expected across IoT, automotive

Reiterate Underperform, raise PO slightly to \$62 on unch. 7x CY25E EV/S following JanQ sales (\$51.6mn) in line with consensus and AprQ slight beat (\$54mn sales guide, 1% above consensus). Mgmt stated that both end markets (IoT and automotive) should grow both QoQ in AprQ and YoY for FY25E as inventory correction reaches an end and AI-levered growth drives performance, guiding AprQ sales +5% QoQ. Autos market reportedly no longer seeing additional program pushouts and cancellations, yet signs of marked improvement still pending (autos segment about 1/3 of sales, -14% YoY in FY24). Ambarella(AMBA) saw inventory correction earlier than peers, now contributing to stronger 1H24E performance expectations vs peers who are expecting more 2H-weighted recovery. Emphasis remains on CV3 SoC family ramping revenue starting CY26E (CY72) and CY27E signals a lack of n-t visibility, yet new/expanded programs at key customers incl Continental/Kodiak Robotics point to attractiveness of tech. Gross margins declining 10-20bps QoQ through the year limits positive outlook, with headwinds mostly related to mix likely worsening as auto products ramp. Net-net, we lower FY25E sales slightly and raise 26E sales on positive n-t recovery outlook, raising EPS 4c/16c, with a sight on EPS profitability in CY26E.

Likes: Revenue growth resumes, auto products, Edge AI

1) Mgmt resilient on revenue growth expectations sequentially and YoY in CY24E, seeing path to \$250mn annual sales at +10% YoY growth; 2) Auto business with new CV3 platform generating revenue in CY26E levered to high-content ADAS/AD applications could be future growth accelerator; 3) Early to invest in Edge AI products, standing to benefit as market growth takes off in the coming years.

Dislikes: Visibility, gross margins falling, unprofitable

1) Extended product revenue ramp (CV3 in CY26E/27E, CV2 ramp in FY25E) point to limited visibility, following last Q's reports of auto OEM program pushouts and cancellations; 2) GMs to fall back to 59%-62% l-t model as products ramp, dropping 10-20bps QoQ through CY24E and potentially worsening as auto products ramp; 3) Business remains subscale, with negative profitability potentially through end of CY26E.

Estimates (Jan) (US\$)	2023A	2024A	2025E	2026E	2027E
EPS	1.10	(0.83)	(0.89)	(0.24)	0.29
GAAP EPS	(1.70)	(4.25)	(3.78)	(3.24)	(2.81)
EPS Change (YoY)	-31.7%	NM	-7.2%	73.0%	NM
Consensus EPS (Bloomberg)			(0.77)	0.26	NA
DPS	0	0	0	0	0
Valuation (Jan)					
P/E	52.7x	NM	NM	NM	199.9x
EV / EBITDA*	33.2x	NM	NM	93.2x	25.2x
Free Cash Flow Yield*	1.4%	0.4%	-1.8%	-0.3%	1.0%

* For full definitions of *IQmethod™* measures, see page 12.

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Timestamp: 27 February 2024 10:35PM EST

27 February 2024

Equity

Key Changes

(US\$)	Previous	Current
Price Obj.	58.00	62.00
2025E Rev (m)	254.2	250.0
2026E Rev (m)	308.6	311.5
2027E Rev (m)	NA	358.0
2025E EPS	-0.92	-0.89
2026E EPS	-0.40	-0.24
2027E EPS	NA	0.29

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Stock Data

Price	57.96 USD
Price Objective	62.00 USD
Date Established	27-Feb-2024
Investment Opinion	C-3-9
52-Week Range	43.59 USD - 95.74 USD
Mkt Val (mn) / Shares Out (mn)	2,039 USD / 35.2
Free Float	94.0%
Average Daily Value (mn)	28.45 USD
BofA Ticker / Exchange	AMBA / NAS
Bloomberg / Reuters	AMBA US / AMBA.OQ
ROE (2025E)	-6.6%
Net Dbt to Eqty (Jan-2024A)	-25.9%
ESGMeter™	Medium

ESGMeter is not indicative of a company's future stock price performance and is not an investment recommendation or rating. ESGMeter is independent of BofA Global Research's equity investment rating, volatility risk rating, income rating, and price objective for that company. For full details, refer to "BofA ESGMeter Methodology".

MBA = Ambarella, CV = Computer Vision
ADAS = Advanced driver assistance systems,
AV = autonomous vehicle, SoC = System-on-chip,
IP = Intellectual Property, IoT= Internet of things

iQprofileSM Ambarella

iQmethodSM – Bus Performance*

(US\$ Millions)	2023A	2024A	2025E	2026E	2027E
Return on Capital Employed	5.9%	-5.6%	-6.4%	-2.3%	1.3%
Return on Equity	7.5%	-5.7%	-6.6%	-1.9%	2.2%
Operating Margin	11.7%	-16.4%	-15.9%	-4.4%	2.2%
Free Cash Flow	29	7	(37)	(6)	20

iQmethodSM – Quality of Earnings*

(US\$ Millions)	2023A	2024A	2025E	2026E	2027E
Cash Realization Ratio	1.0x	NM	NM	NM	2.6x
Asset Replacement Ratio	0.8x	0.5x	0.8x	0.8x	0.7x
Tax Rate	7.8%	NM	NM	NM	NM
Net Debt-to-Equity Ratio	-18.7%	-25.9%	-20.3%	-19.5%	-22.4%
Interest Cover	NA	NA	NA	NA	NA

Income Statement Data (Jan)

(US\$ Millions)	2023A	2024A	2025E	2026E	2027E
Sales	338	226	250	311	358
% Change	1.7%	-32.9%	10.4%	24.6%	14.9%
Gross Profit	216	143	155	193	221
% Change	2.4%	-33.5%	8.3%	24.2%	14.8%
EBITDA	59	(19)	(33)	21	77
% Change	-24.8%	NM	-74.7%	NM	270.0%
Net Interest & Other Income	3	6	6	6	6
Net Income (Adjusted)	43	(33)	(36)	(10)	12
% Change	-30.7%	NM	-9.4%	72.4%	NM

Free Cash Flow Data (Jan)

(US\$ Millions)	2023A	2024A	2025E	2026E	2027E
Net Income from Cont Operations (GAAP)	(65)	(169)	(154)	(132)	(115)
Depreciation & Amortization	19	24	11	14	16
Change in Working Capital	(17)	39	(2)	3	4
Deferred Taxation Charge	0	0	0	0	0
Other Adjustments, Net	107	126	117	121	125
Capital Expenditure	(15)	(12)	(9)	(11)	(11)
Free Cash Flow	29	7	-37	-6	20
% Change	-0.3%	-75.4%	NM	84.6%	NM
Share / Issue Repurchase	0	0	0	0	0
Cost of Dividends Paid	0	0	0	0	0
Change in Debt	0	0	0	0	0

Balance Sheet Data (Jan)

(US\$ Millions)	2023A	2024A	2025E	2026E	2027E
Cash & Equivalents	114	145	108	102	122
Trade Receivables	52	25	34	39	45
Other Current Assets	139	110	112	113	114
Property, Plant & Equipment	12	10	15	18	24
Other Non-Current Assets	394	367	367	365	365
Total Assets	710	658	635	636	669
Short-Term Debt	0	0	0	0	0
Other Current Liabilities	83	83	91	100	111
Long-Term Debt	0	0	0	0	0
Other Non-Current Liabilities	21	15	15	15	15
Total Liabilities	104	98	106	115	126
Total Equity	606	560	530	522	543
Total Equity & Liabilities	710	658	635	636	669

* For full definitions of iQmethodSM measures, see page 12.

Company Sector

Semiconductors

Company Description

Ambarella is a fabless developer of low-power, high-definition (HD) and Ultra HD video compression, image processing, and computer vision chips. Ambarella combines its processor design with expertise in video/image processing, computer vision algorithms, and software to provide a platform that is scalable across a multitude of applications such as: security, sports, wearable, drone, and automotive video cameras. The company was founded in 2004 and went public in 2012.

Investment Rationale

Ambarella's differentiated computer vision technology positions it well to grow into a potentially multi-billion dollar opportunity across security cameras, automotive cameras, and robotics longer term. However, we remain cautious given macro/trade uncertainty. The stock's premium valuation versus broader semis also sets a high bar for execution.

Stock Data

Average Daily Volume 490,870

Quarterly Earnings Estimates

	2024	2025
Q1	-0.15A	-0.32E
Q2	-0.15A	-0.24E
Q3	-0.28A	-0.17E
Q4	-0.24A	-0.16E

Summary of model changes

Exhibit 1: Summary of Sales and EPS changes

We raise

	Sales (\$mn)			EPS (Non GAAP, ex options)		
	Old	NEW	delta	Old	NEW	delta
1Q25E	\$53	\$54	\$1	(\$0.36)	(\$0.32)	\$0.04
2Q25E	\$60	\$60	(\$0)	(\$0.26)	(\$0.24)	\$0.02
3Q25E	\$68	\$66	(\$2)	(\$0.17)	(\$0.17)	(\$0.00)
4Q25E	\$73	\$70	(\$4)	(\$0.13)	(\$0.16)	(\$0.03)
FY25E	\$254	\$250	(\$4)	(\$0.92)	(\$0.89)	\$0.04
YoY%	12.3%	10.4%	-1.7%	-	-	-
1Q26E	\$73	\$73	(\$0)	(\$0.14)	(\$0.12)	\$0.02
2Q26E	\$76	\$76	\$0	(\$0.11)	(\$0.08)	\$0.03
3Q26E	\$79	\$82	\$3	(\$0.08)	(\$0.00)	\$0.07
4Q26E	\$80	\$80	\$0	(\$0.07)	(\$0.04)	\$0.03
FY26E	\$309	\$311	\$3	(\$0.40)	(\$0.24)	\$0.16
YoY%	21.4%	24.6%	0.9%	-	-	-
1Q27E	\$81	\$84	\$2	(\$0.07)	(\$0.00)	\$0.07
2Q27E	\$85	\$89	\$5	(\$0.03)	\$0.07	\$0.10
3Q27E	\$88	\$93	\$5	\$0.01	\$0.11	\$0.10
4Q27E	\$89	\$93	\$3	\$0.02	\$0.10	\$0.08
FY27E	\$343	\$358	\$15	(\$0.07)	\$0.29	\$0.35
YoY%	11.2%	14.9%	4.3%	-	-	-

Source: BofA Global Research estimates, company report

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Q4 reported vs expectations

Table 1: Reported vs expectations summary

AMBA reported Q4 sales of \$52mn, in line with Street

	Jan-23	Oct-23		Jan-24					
			Guidance	Cons	BofA	Reported	Delta vs Cons	QoQ	YoY
Sales (\$mn)	\$83.3	\$50.6	\$51.5 (\$50 - \$53)	\$51.6	\$51.5	\$51.6	0.1%	2%	-38%
QoQ%	0.3%	-18.6%		2.0%	1.9%	2.0%			
YoY%						-38.1%			
IoT/Other	60.6	31.7		32.3	29.8	33.0		4%	-46%
Automotive	22.7	18.9		21.0	21.8	18.6		-2%	-18%
Gross Margin % (Non GAAP)	63.5%	62.6%	62.5% (62% - 63%)	62.5%	62.5%	62.5%	0	-10	-102
R&D (Non GAAP)	35.6	35.1			37.2	34.0		(3 %)	(4 %)
SG&A (Non GAAP)	10.4	9.0			9.2	10.1		12 %	(3 %)
Opex Total (Non GAAP)	46.0	44.1	\$46.5 (\$45 - \$48)		46.5	44.1		(0 %)	(4 %)
Operating Income (Non GAAP)	6.9	-12.4			-14.3	-11.8		(5 %)	(271 %)
Op Margin % (Non GAAP)	8.3%	-24.6%		-27.6%	-27.7%	-22.9%	473	168	-3118
Non-GAAP tax rate	-2%	-6%			-5%	-5%			
Income tax expense (Non GAAP)	(0.2)	0.7			29.3	0.1			
Net Income (Non GAAP)	8.9	(11.2)			(42.1)	(9.8)		(12 %)	(210 %)
Diluted EPS (Non GAAP)	\$0.23	(\$0.28)		(\$0.33)	(\$1.04)	(\$0.24)	(25.8 %)	(13 %)	(208 %)
Diluted Shares (Non GAAP)	39.6	40.1			40.4	40.4		1 %	2 %

Source: BofA Global Research estimates, company report, Bloomberg

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Q1 guidance vs expectations

Table 2: Q1 Guidance vs expectations summary

AMBA guided Q1 sales ~1% above Street expectations

	Jan-24			Apr-24E	
	Reported	Old BofA	Cons	Guidance	New BofA
Sales (\$mn)	\$51.6	\$52.9	\$53.7	\$54 (\$52 - \$56)	\$54.0
QoQ%	2.0%	2.6%	4.0%		4.7%
YoY%	-38.1%				-13.0%
IoT/Other	33.0	30.7	33.3		34.3
Automotive	18.6	22.2	22.2		19.7
Gross Margin % (Non GAAP)	62.5%	62.5%	61.9%	62.25% (61.5% - 63%)	62.3%
R&D (Non GAAP)	34.0	38.4			36.7
SG&A (Non GAAP)	10.1	9.7			10.8
Opex Total (Non GAAP)	44.1	48.1		\$47.5 (\$46 - \$49)	47.5
Operating Income (Non GAAP)	-11.8	-15.0			-13.9
Op Margin % (Non GAAP)	-22.9%	-28.4%	-26.1%		-25.6%
Non-GAAP tax rate	-5%	2%			2.0%
Income tax expense (Non GAAP)	0.1	0.6			0.6
Net Income (Non GAAP)	(9.8)	(14.6)			(13.0)
Diluted EPS (Non GAAP)	(\$0.24)	(\$0.36)	(\$0.33)		(\$0.32)
Diluted Shares (Non GAAP)	40.4	40.4			40.8

Source: BofA Global Research estimates, company report, Bloomberg

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Balance sheet, cash flow snapshot

Table 3: Summary of balance sheet and inventory position

Net cash/shr still strong

	4Q23	1Q24	2Q24	3Q24	4Q24		
	Jan-23	Apr-23	Jul-23	Oct-23	Jan-24	QoQ	YoY
Total Cash	\$207	\$227	\$217	\$222	\$220	-1.1%	6.3%
ST Debt	\$0	\$0	\$0	\$0	\$0		
LT Debt	\$0	\$0	\$0	\$0	\$0		
Total Debt	\$0	\$0	\$0	\$0	\$0		
Net Cash	\$207	\$227	\$217	\$222	\$220	-1.1%	6.3%
Net Cash/Share	\$5.32	\$5.78	\$5.45	\$5.55	\$5.45	-1.9%	2.4%
DSO	56.8	43.7	44.2	41.3	44.0		
DPO	48.2	94.7	45.9	41.0	124.9		
Inventory \$	\$40	\$41	\$35	\$31	\$29	-5.7%	-28.3%
Inventory Turns	3.3	2.4	2.7	2.7	2.9		
Inventory Days	109.7	152.8	134.1	136.3	127.6	-8.6	17.9
Cash Conversion days	118.3	101.7	132.3	136.5	46.7		
Cash Flow from Ops	\$5	\$22	(\$7)	\$8	(\$4)	-150.5%	-178.0%
Capex	(\$2)	(\$2)	(\$5)	(\$2)	(\$2)		
Free cash flow	\$3	\$20	(\$12)	\$6	(\$6)	-206.4%	-291.7%

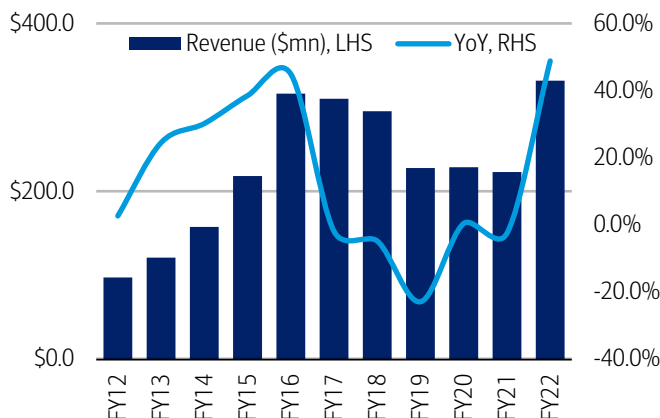
Source: BofA Global Research estimates, company report

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Key charts

Chart 1: AMBA annual revenue and YoY growth

Annual revenue growth in FY25E to resume

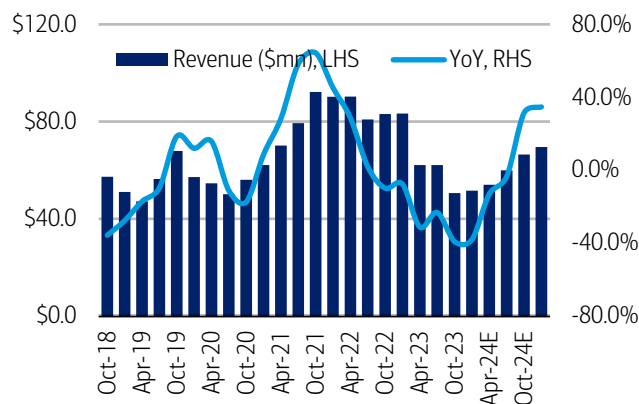


Source: BofA Merrill Lynch Global Research estimates, company report

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Chart 2: AMBA quarterly revenue and YoY growth

Quarterly revenue growth to recover as inventory corrections end

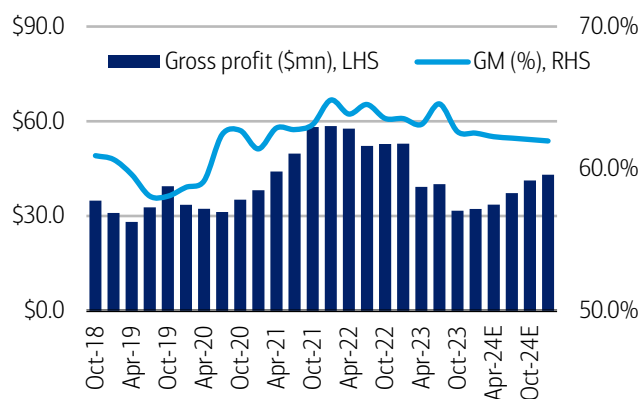


Source: BofA Merrill Lynch Global Research estimates, company report

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Chart 3: AMBA quarterly gross profit and gross margin

Gross margins could stabilize around 62%

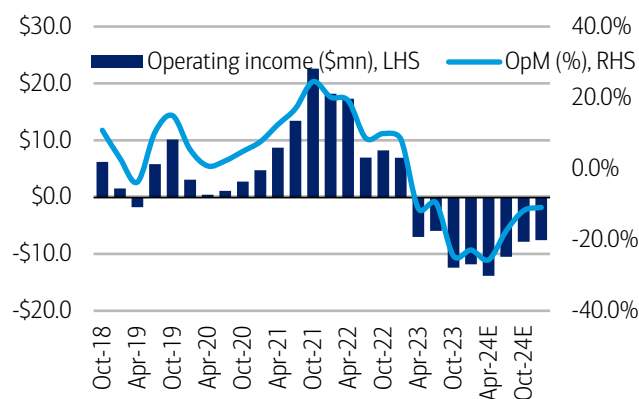


Source: BofA Merrill Lynch Global Research estimates, company report

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Chart 4: AMBA quarterly operating income and operating margin

Operating expenses increasing

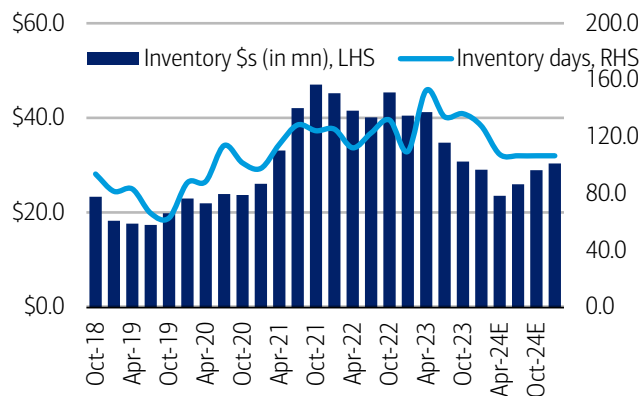


Source: BofA Merrill Lynch Global Research estimates, company report

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Chart 5: AMBA quarterly inventory dollars and days trends

Quarterly inventory days stabilize long-term

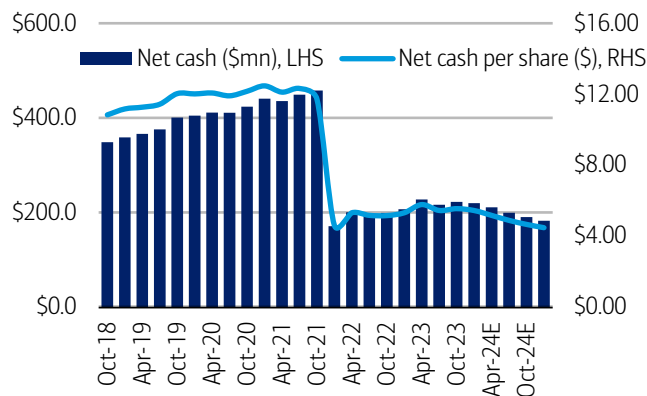


Source: BofA Merrill Lynch Global Research estimates, company report

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Chart 6: AMBA quarterly net cash and net cash per share trends

AMBA quarterly net cash underscores balance sheet strength

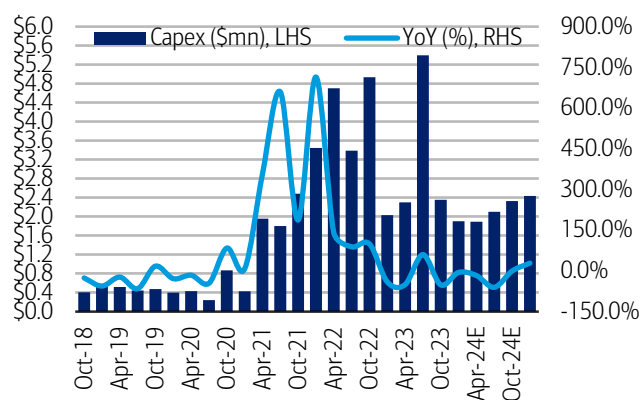


Source: BofA Merrill Lynch Global Research estimates, company report

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Chart 7: AMBA quarterly capex and YoY growth

Quarterly capex an insignificant portion of revenue

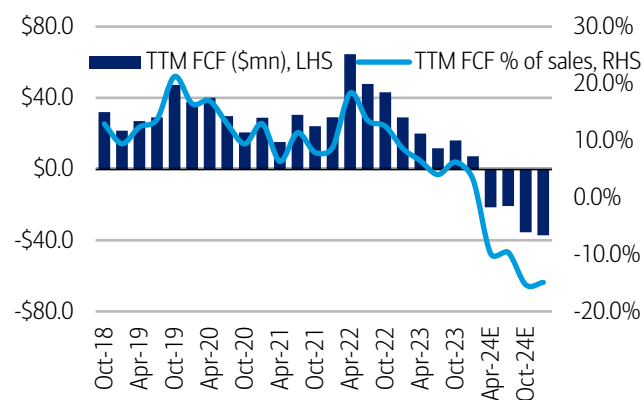


Source: BofA Merrill Lynch Global Research estimates, company report

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Chart 8: AMBA quarterly TTM FCF and TTM FCF as a % of sales

FCF will likely fall in near-term as model sees topline headwind



Source: BofA Merrill Lynch Global Research estimates, company report

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**Exhibit 2: AMBA – Income Statement**

AMBA will likely generate sales about \$250mn of sales in FY25E

P&L Model (\$mn)	1Q23 Apr-22	2Q23 Jul-22	3Q23 Oct-22	4Q23 Jan-23	1Q24 Apr-23	2Q24 Jul-23	3Q24 Oct-23	4Q24 Jan-24	1Q25E Apr-24E	2Q25E Jul-24E	3Q25E Oct-24E	4Q25E Jan-25E	FY23 Jan-23	FY24 Jan-24	FY25E Jan-25
Revenues	\$90.3	\$80.9	\$83.1	\$83.3	\$62.1	\$62.1	\$50.6	\$51.6	\$54.0	\$59.9	\$66.5	\$69.5	\$337.6	\$226.5	\$250.0
QoQ%	0.1%	-10.4%	2.7%	0.3%	-25.4%	0.0%	-18.6%	2.0%	4.7%	10.9%	10.9%	4.6%			
YoY%	28.8%	2.0%	-9.8%	-7.7%	-31.2%	-23.2%	-39.1%	-38.1%	-13.0%	-3.5%	31.4%	34.7%	1.7%	-32.9%	10.4%
Cost of revenues (GAAP)	33.8	29.8	31.4	33.7	24.6	23.7	20.6	20.8	19.9	22.2	24.8	26.0	128.7	89.7	92.9
Gross profit (GAAP)	56.5	51.1	51.7	49.6	37.5	38.5	30.0	30.9	34.1	37.7	41.7	43.6	208.9	136.8	157.1
Stock based compensation expense, other	1.1	1.1	1.1	3.3	1.7	1.6	1.7	1.4	(0.5)	(0.5)	(0.5)	(0.5)	6.6	6.4	(1.9)
Gross profit (Non GAAP, ex. stock comp)	57.7	52.2	52.8	52.9	39.2	40.1	31.7	32.3	33.6	37.2	41.2	43.1	215.6	143.3	155.2
R&D expenses (GAAP)	46.7	52.3	52.9	53.1	54.4	54.9	53.7	52.0	56.2	56.8	58.0	59.4	204.9	215.1	230.4
R&D expenses (Non GAAP, ex. stock comp)	29.5	34.5	34.1	35.6	36.1	36.4	35.1	34.0	36.7	37.1	38.2	39.4	133.7	141.6	151.4
SG&A expenses (GAAP)	20.4	18.9	18.9	20.0	18.6	18.9	18.2	20.6	20.5	20.5	20.8	21.3	78.2	76.3	83.1
SG&A expenses (Non GAAP, ex. stock comp)	10.8	10.8	10.5	10.4	10.1	9.7	9.0	10.1	10.8	10.7	10.9	11.3	42.5	38.8	43.6
Total operating expenses (GAAP)	67.0	71.3	71.8	73.1	73.1	73.8	71.9	72.6	76.7	77.2	78.8	80.7	283.2	291.4	313.4
Total operating expenses (Non GAAP, ex. stock comp)	40.4	45.2	44.6	46.0	46.2	46.0	44.1	44.1	47.5	47.8	49.1	50.7	176.2	180.4	195.0
Operating Income (GAAP)	(10.5)	(20.2)	(20.1)	(23.4)	(35.5)	(35.3)	(42.0)	(41.7)	(42.6)	(39.5)	(37.1)	(37.1)	(74.3)	(154.6)	(156.4)
Operating Income (Non GAAP, ex stock comp)	17.3	7.0	8.2	6.9	(7.0)	(5.9)	(12.4)	(11.8)	(13.9)	(10.5)	(7.8)	(7.6)	39.4	(37.2)	(39.8)
Other income (GAAP)	0.1	(0.0)	1.4	1.8	1.3	0.7	1.9	2.1	1.5	1.5	1.5	1.5	3.3	6.0	6.0
Income before tax (GAAP)	(10.4)	(20.2)	(18.7)	(21.6)	(34.3)	(34.6)	(40.1)	(39.6)	(41.1)	(38.0)	(35.6)	(35.6)	(70.9)	(148.5)	(150.4)
Income before tax (Non GAAP)	17.4	6.9	9.6	8.7	(5.7)	(5.2)	(10.5)	(9.7)	(12.4)	(9.0)	(6.3)	(6.1)	42.7	(31.2)	(33.8)
Net Income (GAAP)	(10.8)	(23.7)	(19.8)	(11.1)	(35.9)	(31.2)	(41.7)	(60.6)	(42.1)	(39.0)	(36.6)	(36.6)	(65.4)	(169.4)	(154.4)
Net income (Non GAAP, ex. stock comp)	17.1	7.6	9.5	8.9	(6.0)	(6.0)	(11.2)	(9.8)	(13.0)	(9.6)	(6.9)	(6.7)	43.1	(33.1)	(36.2)
Diluted EPS (GAAP)	(\$0.29)	(\$0.62)	(\$0.51)	(\$0.29)	(\$0.91)	(\$0.79)	(\$1.04)	(\$1.50)	(\$1.03)	(\$0.96)	(\$0.90)	(\$0.90)	(\$1.70)	(\$4.25)	(\$3.78)
Diluted EPS (Non GAAP, ex. stock comp)	\$0.44	\$0.20	\$0.24	\$0.23	(\$0.15)	(\$0.15)	(\$0.28)	(\$0.24)	(\$0.32)	(\$0.24)	(\$0.17)	(\$0.16)	\$1.10	(\$0.83)	(\$0.89)
YoY%	86.7%	-43.2%	-57.4%	-50.0%	-135.0%	-177.4%	-215.3%	-207.9%	107.3%	55.0%	-39.0%	-32.7%	-31.4%	-175.3%	7.0%
Basic shares	37.7	38.3	38.6	38.9	39.3	39.7	40.1	40.4	40.8	40.8	40.8	40.8	38.4	39.9	40.8
Diluted shares (GAAP)	37.7	38.3	38.6	38.9	39.3	39.7	40.1	40.4	40.8	40.8	40.8	40.8	38.4	39.9	40.8
Diluted shares (Non GAAP)	39.0	38.8	39.1	39.6	39.3	39.7	40.1	40.4	40.8	40.8	40.8	40.8	39.1	39.9	40.8
Non GAAP Margins (ex stock comp)															
Gross Margin %	63.8%	64.5%	63.5%	63.5%	63.1%	64.6%	62.6%	62.5%	62.3%	62.2%	62.1%	62.0%	63.8%	63.3%	62.1%
R&D	32.7%	42.6%	41.1%	42.7%	58.1%	58.5%	69.4%	65.9%	68.0%	61.9%	57.5%	56.6%	39.6%	62.5%	60.6%
SG&A	12.0%	13.3%	12.6%	12.5%	16.3%	15.6%	17.7%	19.5%	19.9%	17.8%	16.4%	16.3%	12.6%	17.2%	17.4%
Opex	44.7%	55.9%	53.7%	55.2%	74.4%	74.1%	87.2%	85.4%	87.9%	79.7%	73.8%	72.8%	52.2%	79.7%	78.0%
Operating Margin %	19.2%	8.6%	9.9%	8.3%	-11.3%	-9.6%	-24.6%	-22.9%	-25.6%	-17.5%	-11.8%	-10.9%	11.7%	-16.4%	-15.9%
Pretax Income %	19.3%	8.6%	11.6%	10.5%	-9.2%	-8.4%	-20.8%	-18.8%	-22.9%	-15.0%	-9.5%	-8.7%	12.6%	-13.8%	-13.5%
Tax rate % (INPUT)	1.8%	-9.9%	1.8%	-2.3%	-5.5%	-16.0%	-6.2%	-5.0%	2.0%	2.0%	2.0%	2.0%	-0.9%	-6.2%	-7.1%
Net income %	18.9%	9.4%	11.4%	10.7%	-9.7%	-9.7%	-22.1%	-19.0%	-24.0%	-16.0%	-10.4%	-9.6%	12.8%	-14.6%	-14.5%

Source: BofA Global Research estimates, company report

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Exhibit 3: AMBA – Segment Model (\$mn)

Autos represented about 34% of sales in FY24

Segment Model (\$mn)	1Q23 Apr-22	2Q23 Jul-22	3Q23 Oct-22	4Q23 Jan-23	1Q24 Apr-23	2Q24 Jul-23	3Q24 Oct-23	4Q24 Jan-24	1Q25E Apr-24E	2Q25E Jul-24E	3Q25E Oct-24E	4Q25E Jan-25E	FY23 Jan-23	FY24 Jan-24	FY25E Jan-25
IoT/Other	67.7	60.3	60.6	60.6	42.4	42.8	31.7	33.0	34.3	38.5	42.3	44.4	249.2	150.0	159.5
Automotive	22.6	20.6	22.5	22.7	19.7	19.3	18.9	18.6	19.7	21.5	24.2	25.1	88.4	76.5	90.4
Total	90.3	80.9	83.1	83.3	62.1	62.1	50.6	51.6	54.0	59.9	66.5	69.5	337.6	226.5	250.0
QoQ %															
IoT/Other	-0.5%	-11.0%	0.5%	0.0%	-30.0%	0.9%	-26.0%	4.2%	4.0%	12.0%	10.0%	5.0%			
Automotive	1.8%	-8.8%	9.2%	0.9%	-13.2%	-2.0%	-2.1%	-1.6%	5.9%	9.0%	12.5%	4.0%			
Total	0.1%	-10.4%	2.7%	0.3%	-25.4%	0.0%	-18.5%	2.0%	4.7%	10.9%	10.9%	4.6%			
YoY %															
IoT/Other	28.6%	0.6%	-14.3%	-10.9%	-37.3%	-29.0%	-47.7%	-45.5%	-19.1%	-10.2%	33.5%	34.5%	-0.8%	-39.8%	6.4%
Automotive	29.1%	6.2%	4.7%	2.3%	-12.8%	-6.3%	-16.0%	-18.1%	0.0%	11.2%	27.8%	35.1%	9.7%	-13.5%	18.2%
Total	28.8%	2.0%	-9.8%	-7.7%	-31.2%	-23.2%	-39.1%	-38.0%	-13.0%	-3.5%	31.3%	34.7%	1.7%	-32.9%	10.4%
% of Sales															
IoT/Other	75.0%	74.5%	72.9%	72.8%	68.3%	68.9%	62.6%	64.0%	63.5%	64.2%	63.7%	63.9%	73.8%	66.2%	63.8%
Automotive	25.0%	25.5%	27.1%	27.2%	31.7%	31.1%	37.4%	36.0%	36.5%	35.8%	36.3%	36.1%	26.2%	33.8%	36.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: BofA Global Research estimates, company report

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Exhibit 4: AMBA – Balance Sheet

AMBA net cash/shr is nearly \$6

Balance Sheet (\$mn)	1Q23 Apr-22	2Q23 Jul-22	3Q23 Oct-22	4Q23 Jan-23	1Q24 Apr-23	2Q24 Jul-23	3Q24 Oct-23	4Q24 Jan-24	1Q25E Apr-24E	2Q25E Jul-24E	3Q25E Oct-24E	4Q25E Jan-25E	FY23 Jan-23	FY24 Jan-24	FY25E Jan-25
Cash and cash equivalents	200.6	194.9	112.8	113.5	127.7	122.5	143.8	144.9	136.0	124.5	115.2	107.7	113.5	144.9	107.7
Marketable securities		3.0	86.2	93.3	99.6	94.0	78.5	75.0	75.0	75.0	75.0	75.0	93.3	75.0	75.0
Accounts receivables, net	28.0	37.7	48.6	52.0	29.8	30.2	23.0	25.0	26.1	29.0	32.1	33.6	52.0	25.0	33.6
Inventories	41.5	40.1	45.4	40.5	41.2	34.8	30.8	29.0	23.5	26.0	28.9	30.4	40.5	29.0	30.4
Prepaid expenses and other current assets	8.1	7.1	5.3	5.3	6.1	5.2	3.7	6.2	6.2	6.2	6.2	6.2	5.3	6.2	6.2
Total current assets	278.3	282.9	298.3	304.6	304.5	286.6	279.8	280.2	266.9	260.7	257.6	252.9	304.6	280.2	252.9
PP&E, net	10.1	10.4	10.8	11.8	11.3	11.2	10.9	10.4	11.5	12.7	14.0	15.4	11.8	10.4	15.4
Deferred tax assets, non-current	14.0	14.2	14.6	19.3	18.4	22.2	23.0	0.2	0.2	0.2	0.2	0.2	19.3	0.2	0.2
Intangible assets, net	48.5	49.6	47.6	58.5	55.5	63.1	58.8	55.1	55.1	55.1	55.1	55.1	58.5	55.1	55.1
Goodwill	303.6	303.6	303.6	303.6	303.6	303.6	303.6	303.6	303.6	303.6	303.6	303.6	303.6	303.6	303.6
Other assets	14.1	13.8	12.6	12.4	11.4	9.4	8.5	8.1	8.1	8.1	8.1	8.1	12.4	8.1	8.1
Total assets	668.7	674.4	687.5	710.2	704.8	696.2	684.6	657.7	645.4	640.4	638.7	635.4	710.2	657.7	635.4
Current liabilities:															
Accounts payable	29.8	22.1	29.1	17.8	25.6	11.9	9.3	28.5	28.0	31.2	34.8	36.5	17.8	28.5	36.5
Accrued liabilities	39.4	48.4	43.6	56.7	46.0	54.0	58.0	48.6	48.6	48.6	48.6	48.6	56.7	48.6	48.6
Income taxes payable	1.5	3.1	3.8	4.1	3.6	2.5	2.4	1.5	1.5	1.5	1.5	1.5	4.1	1.5	1.5
Deferred revenue, current	1.0	0.5	1.0	1.3	1.3	2.7	2.6	0.9	0.9	0.9	0.9	0.9	1.3	0.9	0.9
Short term debt															
Total current liabilities	74.9	77.5	80.9	83.5	80.1	74.7	75.8	83.0	82.5	85.7	89.3	91.0	83.5	83.0	91.0
Long term debt															
Other long-term liabilities	19.5	18.8	18.1	20.6	18.4	19.2	17.0	14.8	14.8	14.8	14.8	14.8	20.6	14.8	14.8
Total liabilities	94.3	96.3	99.1	104.1	98.6	93.9	92.8	97.8	97.3	100.5	104.1	105.8	104.1	97.8	105.8
Stockholders' equity	574.3	578.1	588.4	606.1	606.2	602.3	591.8	559.9	548.1	539.9	534.6	529.6	606.1	559.9	529.6
Total liabilities and equity	668.7	674.4	687.5	710.2	704.8	696.2	684.6	657.7	645.4	640.4	638.7	635.4	710.2	657.7	635.4
Cash and Liquidity Ratios															
Total cash & ST investments	200.6	197.9	199.0	206.9	227.4	216.5	222.3	219.9	211.0	199.5	190.3	182.7	206.9	219.9	182.7
Short-term debt															
Long-term debt															
Total debt															
Net Cash	200.6	197.9	199.0	206.9	227.4	216.5	222.3	219.9	211.0	199.5	190.3	182.7	206.9	219.9	182.7
Net Cash/dil. share	\$5.32	\$5.17	\$5.16	\$5.32	\$5.78	\$5.45	\$5.55	\$5.45	\$5.17	\$4.89	\$4.66	\$4.48	\$5.32	\$5.45	\$4.48
Cash conversion ratios															
Days Sales Outstanding (DSO)	28.2	42.4	53.2	56.8	43.7	44.2	41.3	44.0	44.0	44.0	44.0	44.0			
Days Payables Outstanding (DPO)	80.2	67.4	84.4	48.2	94.7	45.9	41.0	124.9	127.9	127.9	127.9	127.9			
Inventory Turns	3.3	3.0	2.8	3.3	2.4	2.7	2.7	2.9	3.4	3.4	3.4	3.4			
Days of Inventory (DIO)	112.2	122.7	131.8	109.7	152.8	134.1	136.3	127.6	107.6	106.6	106.6	106.6			
Cash conversion days (DIO+DSO-DPO)	60.2	97.8	100.6	118.3	101.7	132.3	136.5	46.7	23.7	22.7	22.7	22.7			

Source: BofA Global Research estimates, company report

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Exhibit 5: AMBA – Cash Flow Statement

AMBA could grow cash in FY25E

Cash flow statement (\$mn)	1Q23 Apr-22	2Q23 Jul-22	3Q23 Oct-22	4Q23 Jan-23	1Q24 Apr-23	2Q24 Jul-23	3Q24 Oct-23	4Q24 Jan-24	1Q25E Apr-24E	2Q25E Jul-24E	3Q25E Oct-24E	4Q25E Jan-25E	FY23 Jan-23	FY24 Jan-24	FY25E Jan-25
Net Income	(10.8)	(23.7)	(19.8)	(11.1)	(35.9)	(31.2)	(41.7)	(60.6)	(42.1)	(39.0)	(36.6)	(36.6)	(65.4)	(169.4)	(154.4)
Adjustments:															
Depreciation of property & equipment	4.6	4.7	5.1	5.5	5.8	6.1	6.5	6.5	2.4	2.7	3.0	3.1	19.9	24.9	11.2
Amortization/accretion of marketable securities			(0.3)	(0.4)	(0.4)	(0.3)	(0.2)	(0.2)					(0.7)	(1.2)	
Loss on disposal of long-lived assets															
Amortization of intangible assets															
Stock compensation expense	27.0	26.9	28.1	29.1	27.3	28.1	27.4	28.5	28.8	29.0	29.3	29.5	111.2	111.3	116.6
Excess income tax benefits (stock-based comp)															
Change in value of warrants															
Other non-cash items, net	1.4	(0.2)	(0.4)	(4.5)	0.9	(2.8)	(0.7)	17.5					(3.7)	14.9	
Change in operating assets/liabilities:															
Accounts receivable	16.3	(9.7)	(10.9)	(3.4)	22.2	(0.3)	7.2	(2.0)	(1.2)	(2.8)	(3.2)	(1.5)	(7.7)	27.0	(8.7)
Inventories	3.7	1.4	(5.3)	4.9	(0.7)	6.5	4.0	1.7	5.5	(2.4)	(3.0)	(1.4)	4.7	11.4	(1.3)
Prepaid expenses and other current assets	(2.7)	2.0	0.8	0.1	(0.8)	0.9	1.5	(2.5)					0.2	(1.0)	
Deferred tax assets															
Other assets	0.4	0.3	0.1	0.1	0.1	(0.0)	0.0						1.0	0.1	
Accounts payable	(2.9)	(9.0)	9.8	(11.3)	7.8	(14.7)	(1.7)	19.2	(0.5)	3.2	3.6	1.7	(13.3)	10.7	8.0
Accrued liabilities	(2.5)	6.9	(1.6)	2.4	(2.6)	2.7	6.8	(9.4)					5.2	(2.5)	
Income taxes payable	0.2	1.6	0.7	0.3	(0.5)	(1.2)	(0.1)	(0.9)					2.9	(2.6)	
Deferred tax liabilities								(0.1)						(0.1)	
Deferred revenue	(0.5)	(0.5)	0.6	(3.6)	(0.2)	0.5	(0.2)	(1.7)					(4.0)	(1.5)	
Net cash from operations	33.6	(0.6)	6.1	5.1	22.0	(6.8)	7.9	(4.0)	(7.0)	(9.4)	(6.9)	(5.1)	44.1	19.1	(28.5)
Investment in a private company															
Purchase of investments		(3.0)	(84.7)	(9.8)	(19.8)	(14.4)	(0.3)	(0.3)					(97.4)	(34.7)	
Sales of investments			0.8	1.7	1.5	1.1	2.6	2.6					2.4	7.9	
Maturities of investments				2.0	12.4	18.9	13.0	13.0					2.0	57.3	
Net proceeds from disposal of fixed assets															
Purchases of PP&E	(4.7)	(3.4)	(4.9)	(2.0)	(2.3)	(5.4)	(2.4)	(1.9)	(1.9)	(2.1)	(2.3)	(2.4)	(15.1)	(11.9)	(8.7)
Purchase of intangible assets															
Restricted Cash															
Net cash (used in) provided from investments	(4.0)	(6.4)	(88.8)	(8.1)	(8.2)	0.2	13.0	13.5	(1.9)	(2.1)	(2.3)	(2.4)	(107.3)	18.5	(8.7)
Proceeds from exercise of stock options, etc.	1.9	2.2	2.7	3.8	2.6	2.6	1.7	(7.0)					10.6	(0.1)	
Stock repurchase															
Repurchase of ordinary shares, at cost															
Net proceeds from issuance of preference shares															
Excess income tax benefits (stock-based comp)	0.0	0.1	(0.1)	(0.0)									0.0		
Net cash from financing	(0.0)	1.3	0.7	3.8	0.4	1.4	0.4	(8.4)					5.7	(6.2)	
Increase in cash & equivalents	29.6	(5.7)	(82.1)	0.7	14.2	(5.2)	21.3	1.1	(8.9)	(11.5)	(9.2)	(7.6)	(57.5)	31.4	(37.2)
Cash & equivalents at end	200.6	194.9	112.8	113.5	127.7	122.5	143.8	144.9	136.0	124.5	115.2	107.7	113.5	144.9	107.7
Free cash flow (FCF)	28.9	(4.0)	1.1	3.1	19.7	(12.2)	5.5	(5.9)	(8.9)	(11.5)	(9.2)	(7.6)	29.0	7.1	(37.2)
FCF/share	\$0.74	(\$0.10)	\$0.03	\$0.08	\$0.50	(\$0.31)	\$0.14	(\$0.15)	(\$0.22)	(\$0.28)	(\$0.23)	(\$0.19)	\$0.74	\$0.18	(\$0.91)
TTM FCF	64.5	47.8	43.1	29.0	19.9	11.7	16.1	7.1	(21.5)	(20.8)	(35.5)	(37.2)			
TTM FCF as a % of sales	18%	14%	13%	9%	6%	4%	6%	3%	-10%	-10%	-15%	-15%	9%	3%	-15%

Source: BofA Global Research estimates, company report

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Price objective basis & risk

Ambarella (AMBA)

Our price objective of \$62 is based on 7x CY25E EV/S, at the lower end of historical 6x-15x trading range. We assign AMBA a multiple that is at the lower end of the range based on the company's long-term growth potential offset by near-term headwinds/uncertainty.

Upside risks to our PO: Faster penetration of CV chip technology in focus automotive/security markets, and semiconductor industry consolidation.

Downside risks to our PO: US-China trade tensions which could negatively impact security camera market sales, semiconductor cyclicalities, further deterioration in legacy consumer businesses, failure to successfully penetrate target auto/security markets with new computer vision chip roadmap and excess inventory.

Analyst Certification

I, Vivek Arya, 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.

US - Semiconductors and Semiconductor Capital Equipment Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	Advanced Micro Devices, Inc	AMD	AMD US	Vivek Arya
	Analog Devices Inc.	ADI	ADI US	Vivek Arya
	Applied Materials, Inc.	AMAT	AMAT US	Vivek Arya
	Arm Holdings	ARM	ARM US	Vivek Arya
	Broadcom Inc	AVGO	AVGO US	Vivek Arya
	Cadence	CDNS	CDNS US	Vivek Arya
	Camtek	CAMT	CAMT US	Vivek Arya
	KLA Corporation	KLAC	KLAC US	Vivek Arya
	Lam Research Corp.	LRCX	LRCX US	Vivek Arya
	M/A-Com	MTSI	MTSI US	Vivek Arya
	Marvell Technology Group Ltd.	MRVL	MRVL US	Vivek Arya
	Microchip	MCHP	MCHP US	Vivek Arya
	Micron Technology, Inc	MU	MU US	Vivek Arya
	Nova	NVMI	NVMI US	Vivek Arya
	NVIDIA Corporation	NVDA	NVDA US	Vivek Arya
	NXP Semiconductors NV	NXPI	NXPI US	Vivek Arya
	onsemi	ON	ON US	Vivek Arya
	Synopsys	SNPS	SNPS US	Vivek Arya
NEUTRAL				
	Advanced Energy Industries	AEIS	AEIS US	Duksan Jang
	Allegro MicroSystems	ALGM	ALGM US	Blake Friedman
	Axcelis Technologies	ACLS	ACLS US	Duksan Jang
	Coherent Corp	COHR	COHR US	Vivek Arya
	GlobalFoundries	GFS	GFS US	Vivek Arya
	Intel	INTC	INTC US	Vivek Arya
	Lattice Semiconductor	LSCC	LSCC US	Blake Friedman
	Texas Instruments Inc.	TXN	TXN US	Vivek Arya
UNDERPERFORM				
	Ambarella	AMBA	AMBA US	Vivek Arya
	Credo Technology	CRDO	CRDO US	Vivek Arya
	Lumentum Holdings	LITE	LITE US	Vivek Arya
	Qorvo Inc.	QRVO	QRVO US	Vivek Arya
	Skyworks Solutions, Inc.	SWKS	SWKS US	Vivek Arya



US - Semiconductors and Semiconductor Capital Equipment Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
	Teradyne	TER	TER US	Vivek Arya
	Wolfspeed Inc	WOLF	WOLF US	Vivek Arya

iQmethodSM Measures Definitions

Business Performance	Numerator	Denominator
Return On Capital Employed	$\text{NOPAT} = (\text{EBIT} + \text{Interest Income}) \times (1 - \text{Tax Rate}) + \text{Goodwill Amortization}$	$\text{Total Assets} - \text{Current Liabilities} + \text{ST Debt} + \text{Accumulated Goodwill Amortization}$
Return On Equity	Net Income	Shareholders' Equity
Operating Margin	Operating Profit	Sales
Earnings Growth	Expected 5 Year CAGR From Latest Actual	N/A
Free Cash Flow	$\text{Cash Flow From Operations} - \text{Total Capex}$	N/A
Quality of Earnings	Numerator	Denominator
Cash Realization Ratio	Cash Flow From Operations	Net Income
Asset Replacement Ratio	Capex	Depreciation
Tax Rate	Tax Charge	Pre-Tax Income
Net Debt-To-Equity Ratio	$\text{Net Debt} = \text{Total Debt} - \text{Cash \& Equivalents}$	Total Equity
Interest Cover	EBIT	Interest Expense
Valuation Toolkit	Numerator	Denominator
Price / Earnings Ratio	Current Share Price	Diluted Earnings Per Share (Basis As Specified)
Price / Book Value	Current Share Price	Shareholders' Equity / Current Basic Shares
Dividend Yield	Annualised Declared Cash Dividend	Current Share Price
Free Cash Flow Yield	$\text{Cash Flow From Operations} - \text{Total Capex}$	$\text{Market Cap} = \text{Current Share Price} \times \text{Current Basic Shares}$
Enterprise Value / Sales	$\text{EV} = \text{Current Share Price} \times \text{Current Shares} + \text{Minority Equity} + \text{Net Debt} + \text{Other LT Liabilities}$	Sales
EV / EBITDA	Enterprise Value	$\text{Basic EBIT} + \text{Depreciation} + \text{Amortization}$

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.

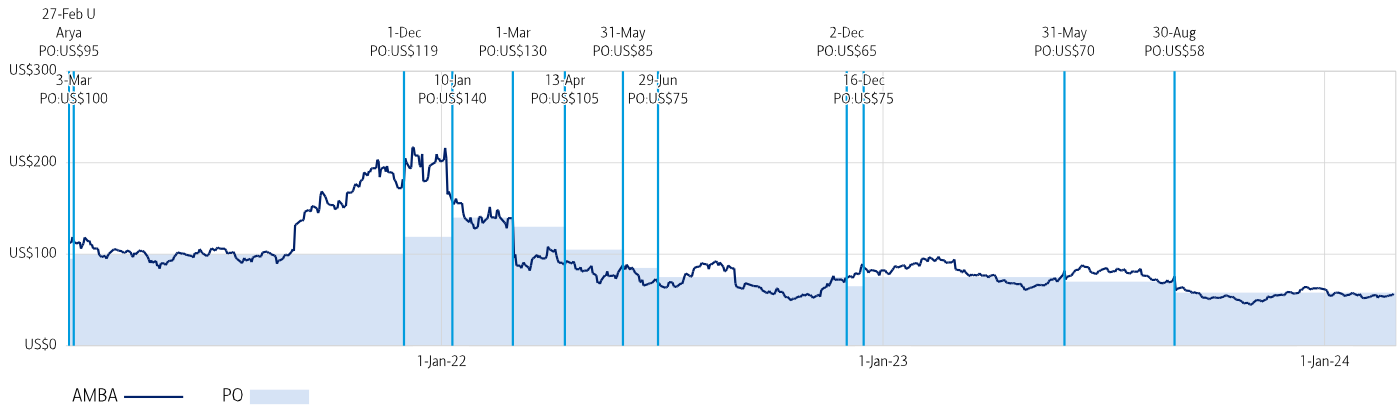
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Ambarella (AMBA) Price Chart



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

The Investment Opinion System is contained at the end of the report under the heading "Fundamental Equity Opinion Key". Dark grey shading indicates the security is restricted with the opinion suspended. Medium grey shading indicates the security is under review with the opinion withdrawn. Light grey shading indicates the security is not covered. Chart is current as of a date no more than one trading day prior to the date of the report.

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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