

## US Semiconductors

## Pre-CES Takeaways: NVDA, AMD launch AI-PC, Gaming products

Industry Overview

**Key theme: AI at the edge, ongoing implementation**

Earlier today as part of the annual Consumer Electronics Show (CES) pre-show, AMD and NVDA hosted keynotes and launched several new products. Overall, AMD focused on broadening its AI PC portfolio and ecosystem, now offering AI PC hardware on both laptops and desktops (vs. laptop only for INTC). It also offered a solid roadmap toward next year's second-gen NPU-integrated CPUs and continued expanding Ryzen support on various AI platforms (Hugging Face, Adobe Firefly, etc.). While AI use cases are still limited in edge devices (PCs, smartphones), we highlight quickly expanding hardware and software ecosystem (though we believe there is still some investor skepticism on how much incremental pricing lift AI features in PCs can claim). NVDA similarly launched several new AI services for PC gamers, expanding its AI leadership and technologies. Maintain Buy ratings for AMD and NVDA on continued progress in AI monetization.

**AMD: AI now available in both laptops and desktops**

AMD now offers AI PC CPUs across both laptops and desktops via integrated NPUs. After launching the Ryzen 7040 "Phoenix" series – world's first laptop CPUs with integrated NPUs – last year, AMD is set to launch its follow-on Ryzen 8040 "Hawk Point" CPUs later in February. The new processor offers +60% more NPU TOPS. AMD also launched Ryzen 8000G series today, world's first desktop CPUs with integrated NPUs, which should ramp throughout the year alongside its laptop counterpart. Though we anticipate catch ups with follow-on offerings, INTC currently only offers AI CPUs on laptops (Meteor Lake) today, suggesting AMD's lead in AI hardware. Pricing trends are not available, but per third party (Mercury) forecasts, AI features (such as NPU) will be used more to maintain ASP rather than to raise ASPs in PC processors.

**NVDA showcases ability to bring AI to gamers/consumers**

NVDA presentation hosted by Jeff Fisher focused on AI opportunities with the consumer. RTX GPUs launched only 5 years ago, but NVDA's groundbreaking ray tracing, DLSS, and AI technologies are now utilized by 500+ games and applications. Combined with software leadership, NVDA is bringing genAI benefits beyond gamers, rolling out: 1) NVDA RTX Remix (RTX remasters of games into 4k+ resolution), 2) Chat with RTX (enables users to connect LLMs to own data to improve interactions with personal notes/documents), and 3) microservices for Nvidia ACE (Avatar Cloud Engine, enhances ability to develop dynamic digital avatars). NVDA is also assisting in PC AI model use/development with its new AI workbench (AI toolkit for developers) and TensorRT-LLM for Windows platform (accelerates LLMs on RTX-based PCs by up to 5x). In hardware, NVDA unveiled its RTX 40 SUPER line, including the 4080 SUPER for \$999 (up to 2x faster than 3080 Ti), 4070 Ti SUPER for \$799 (up to 2.5x faster than 3070 Ti), and the 4070 SUPER for \$599 (faster than RTX 3090 at lower power). Beyond consumer, NVDA mentioned at a sell-side conference it is bringing AI to healthcare with its BioNeMo AI platform assisting in developing models for drug discovery. NVDA is partnered with numerous companies, incl. Amgen, who also just announced they will build AI models using a DGX SuperPOD.

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Timestamp: 08 January 2024 04:46PM EST

08 January 2024

Equity  
United States  
Semiconductors

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**Glossary**

AMD: Advanced Micro Devices

NVDA: NVIDIA

INTC: Intel

AI: Artificial Intelligence

CPU: Central Processing Unit

GPU: Graphics Processing Unit

NPU: Neural Processing Unit

PC: Personal Computer

ASP: Average Selling Price

TOPS: Trillion Operations Per Second

CES: Consumer Electronics Show

OEM: Original Equipment

Manufacturer

**Stocks mentioned**

Prices and ratings for stocks mentioned in this report

<b>BofA Ticker</b>	<b>Bloomberg ticker</b>	<b>Company name</b>	<b>Price</b>	<b>Rating</b>
AMD	AMD US	Advanced Micro	US\$ 138.58	C-1-9
NVDA	NVDA US	NVIDIA	US\$ 490.97	C-1-7

Source: BofA Global Research

**Price objective basis & risk****Advanced Micro Devices, Inc (AMD)**

Our \$165 PO is based on 32x our 2025E non-GAAP EPS, which is towards the middle of AMD's historical 17x-64x range, justified by AI upside offset by slowdown in cyclical embedded/console markets.

Downside risks: 1) M&A integration risks, 2) Strong competition from larger names, 3) Lumpy nature of consumer and enterprise spending that could create delays in acceptance and success of new products, 4) High reliance on one outsourced manufacturing partner, 5) Maturity of current game console cycle.

**NVIDIA Corporation (NVDA)**

Our \$700 PO is based on 27x CY25E PE ex cash, within NVDA's historical 26x-69x forward year PE range, justified given stronger growth opportunities ahead as gaming cycle troughs and data center demand potentially faces strong, long-term demand dynamics.

Downside risks to our price objective are: 1) weakness in consumer driven gaming market, 2) Competition with major public firms, internal cloud projects and other private companies in accelerated computing markets, 3) Larger than expected impact from restrictions on compute shipments to China, or additional restrictions placed on activity in the region, 4) Lumpy and unpredictable sales in new enterprise, data center, and autos markets, 5) Potential for decelerating capital returns.

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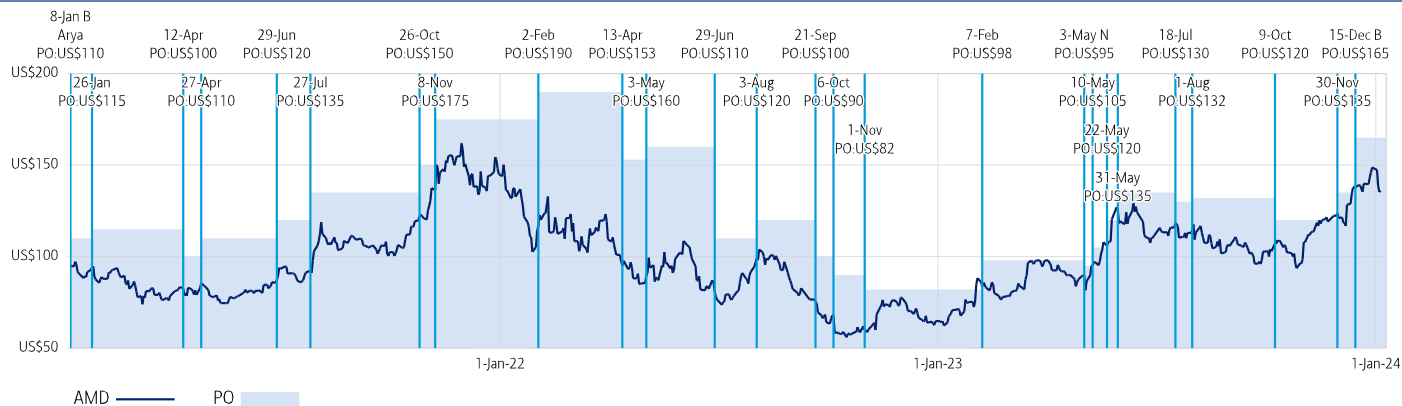
## US - Semiconductors and Semiconductor Capital Equipment Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
<b>BUY</b>				
	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
<b>NEUTRAL</b>				
	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
<b>UNDERPERFORM</b>				
	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
	Teradyne	TER	TER US	Vivek Arya
	Wolfspeed Inc	WOLF	WOLF US	Vivek Arya

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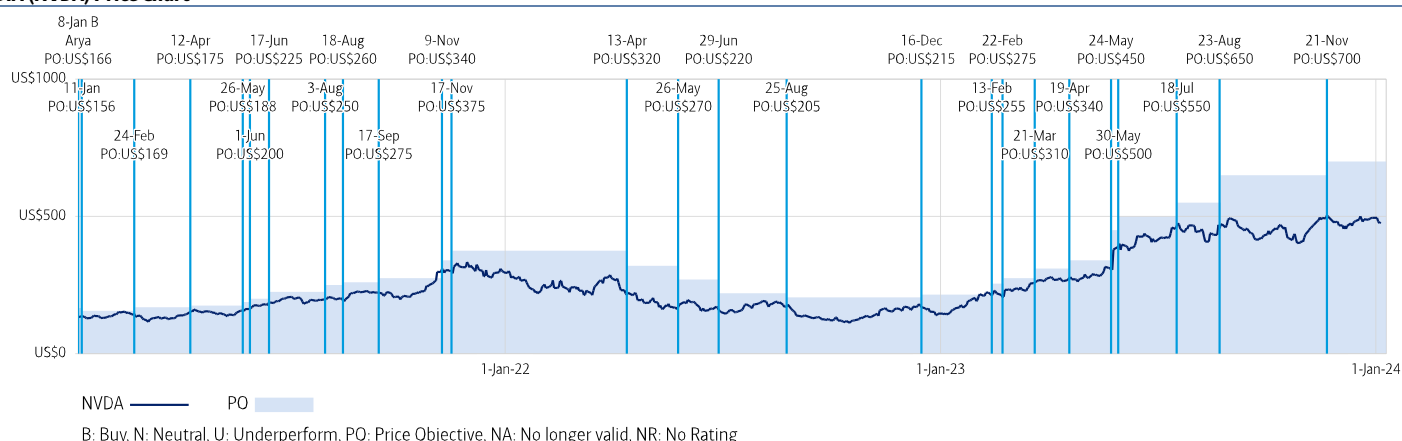
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## Advanced Micro (AMD) Price Chart



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.

**NVIDIA (NVDA) Price Chart**

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

Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R1</sup>	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%

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Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R1</sup>	Count	Percent
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Hold	832	23.54%	Hold	454	54.57%
Sell	807	22.84%	Sell	383	47.46%

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Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

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