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Semiconductor Capital Equipment | North America

7 Debates on SPE

WFE continues to rewrite the bull case as the industry blows past constraints. The market is increasingly unwilling to pay for incremental upside without clearer evidence of duration (AI ROIC). We favor names priced as though 2027 marks the peak (AEIS, MKS, ONTO).

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7 Debates on SPE

Shane Brett (US SPE)

September 7th, 2026

Morgan Stanley

MS WFE Forecast & Our View

2026/27 Bull Case is the Base Case

The industry continues to blow past constraints

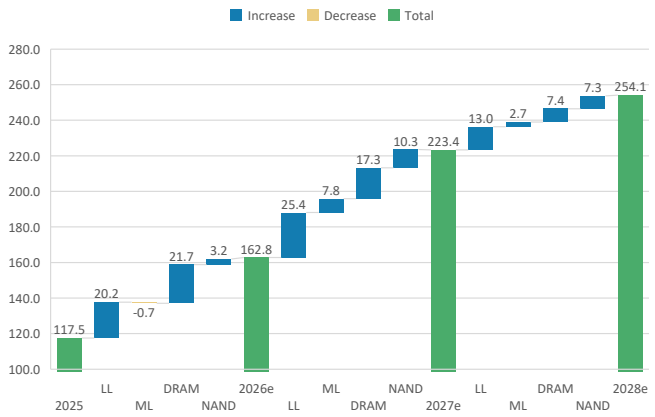
- Since Dec 1st, we have raised our 2026/27 WFE forecast by 26%/54%. We have raised our 2026 DRAM forecast $17bn (47%).
- **DRAM:** We forecast $120bn+ of DRAM WFE over 2026/27, as we model $53bn (+70% y/y) in 2026 and $70bn (+33% y/y) in 2027.
- **Leading Logic:** We forecast leading logic WFE growth of 72% in 2026 and 50% in 2027.
- For further details see: 3Q'26 WFE update (25 Aug 2026)

Our Stock Calls

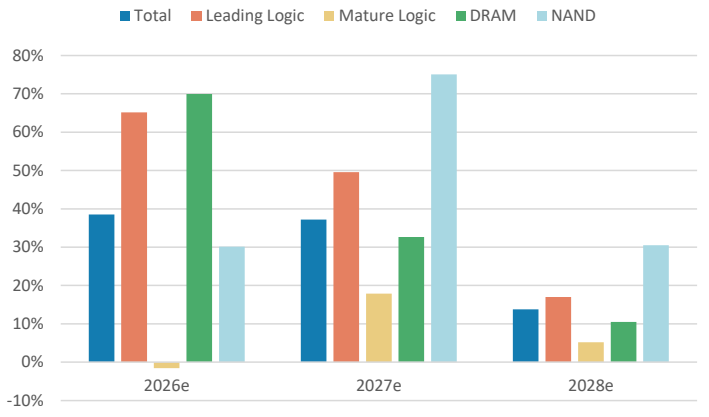
What's left beyond "more capacity expansion"?

- Within our OWs, we have a strong preference for AEIS & MKS over LAM & KLA. We also like ONTO's idiosyncratic story.
- **AEIS & MKS:** In a scenario where WFE meaningfully overshoots to the upside in CY27 (~$230bn+), we see AEIS earning closer to $20 and MKS closer to $21, implying AEIS trades at approx. 13x and MKS 12x earnings.
- **ONTO:** Our idiosyncratic share gain pick.

WFE Growth Bridge



We model NAND > LL > DRAM growth (%) in 2027



Source: Company Data, Morgan Stanley Research. e = Morgan Stanley Research estimates.

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7 Debates on SPE

The WFE Debate

1. Why aren't SPE stocks "working"?

- We think there are 2 camps of thought here:
  1. SPE is part of the AI ROIC trade
  2. WFE expectations (across the buyside) are "full".
- We sympathize with 1, rather than 2, as customers have blown past constraints (cleanroom).

End-Market Debates

2. How does WFE tie into compute?

- How does hyperscaler GW deployment translate to incremental WFE demand?

3. What are the "bull cases" from here

- Intel's capex resurrection, greenfield NAND restart, and DRAM pull-forwards have all realized. What's left beyond more capacity expansion?

4. How do we see DRAM supply?

- DRAM bits have grown 36% y/y YTD (Jun., SIA). We model 32%/38% bit supply growth in 2026/27.

Company Debates

5. Market Share at Intel

- The debate is no longer whether Intel spends, but which suppliers capture the spend

6. HBM de-spec

- As we de-spec from HBM 12-high to 8-high, it doesn't mean that all process steps go down proportionately.

7. Sub-system vs OEM

- AMAT/LAM/KLA trade at a 64% valuation premium to AEIS/MKS vs. 8% historically.

Source: Company Data, Morgan Stanley Research. e = Morgan Stanley Research estimates.

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Debate 1: Why are SPE stocks not "working"?

Our US SPE coverage is trading on trough multiples on either CY27 or CY28 EPS. We think there are 2 explanations/camps;

Camp 1: AI ROIC

SPE is part of the AI ROIC trade

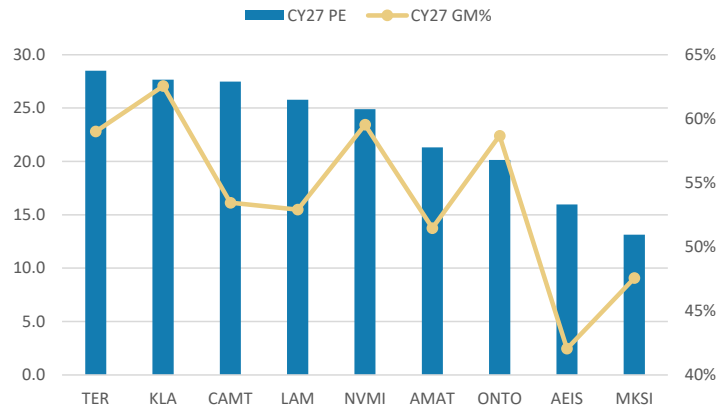
- Implied semi capacity increasingly maps to GW production.
- If investors lack confidence on the GW deployment (DC build out push out, hyperscaler bond/CDS), then AI infra stocks are hard to buy.
- This suggests that the market's view on the fundamentals haven't changed but how it views those fundamentals have changed.
- Given we aren't "comfortable" around further WFE revisions, we're applying trough multiples on CY27 or CY28 EPS.

Camp 2: Expectations

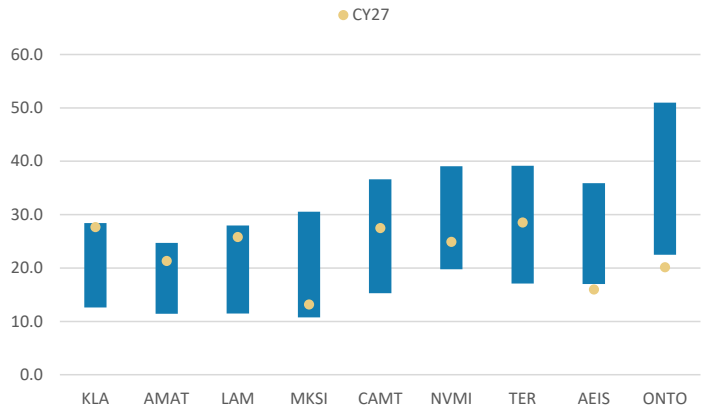
2027/28 WFE expectations are "full"

- We've heard market expectations of around $230bn/$300bn+/- for 2027/2028 WFE vs Mse $223bn/$254bn.
- The perception is that there isn't much room for further upside revisions in buyside estimates.
- Given that perceived "limited upside", we're applying trough multiples on CY27 or CY28 EPS.

US SPE CY27 PE (MSe)



AEIS & ONTO are now trading below historic range (Fwd PE)



Source: Company Data, Morgan Stanley Research. e = Morgan Stanley Research estimates

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Debate 2: How does WFE tie into compute?

Context

WFE per GW

- We update our WFE per GW (NVDA) calculation. While specs (GPU, HBM, LPDDR) aren't finalized for Rubin Ultra, we estimate WFE per GW is roughly consistent with Vera Rubin ($3.4bn), implying $7bn of WFE per $100bn of AI capex.
- Our estimate of $7bn is below LAM's WFE per $100bn of AI capex of $9-10bn. We see our numbers as a lower bound given our analysis is purely focused on NVDA and doesn't consider TPU or Trainium.

Our View

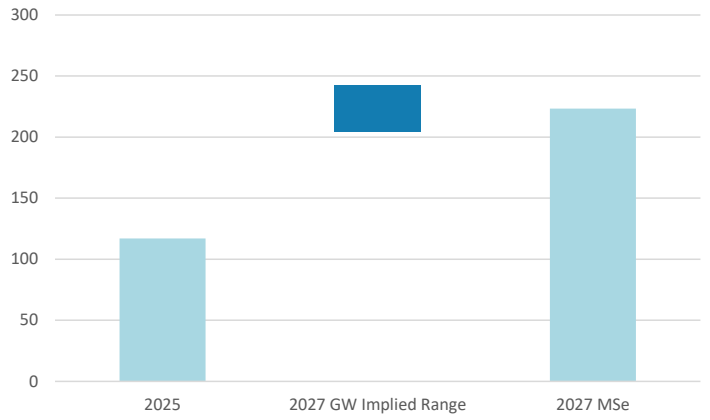
Translating hyperscaler GWs to WFE

- Our Internet Team forecasts Hyperscaler capex to reach $1.2tr in 2027, translating to 29GW of compute.
- Our GW forecast translates to $87-125bn of incremental WFE demand from 2025. The low-end uses MS NVDA GWs vs high-end uses LAM's upper-bound. Assuming no other end-market ex-AI gets incremental capacity, this implies 2027 WFE of $204-242bn vs MSe of $223bn.

WFE per NVDA GW analysis

Monthly Build	GB200 NVL72	Vera Rubin NVL72	Vera Rubin Ultra NVL72
	Blackwell	Vera Rubin	Rubin Ultra
Total WFE per 1GW ($mn)	GB200 NVL72	Vera Rubin NVL72	Vera Rubin Ultra NVL72
Total WFE	2,880	3,372	3,335
Logic	1,315	1,093	1,502
DRAM	1,110	1,223	953
NAND	192	749	622
CoWoS	263	307	257
GPU	926	649	1,088
CPU	231	114	96
HBM (DRAM)	791	898	671
HBM (Logic)	38	45	51
LPDDR	319	326	282
NAND	192	749	622
Networking Silicon	72	247	215
Other Logic Silicon	48	38	53
CoWoS	263	307	257

2027 GW implied range



Source: Company Data, Morgan Stanley Research. e = Morgan Stanley Research estimates

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Debate 3: What are the bull cases from here?

Context

The “bull cases” we had predicted have largely materialized.

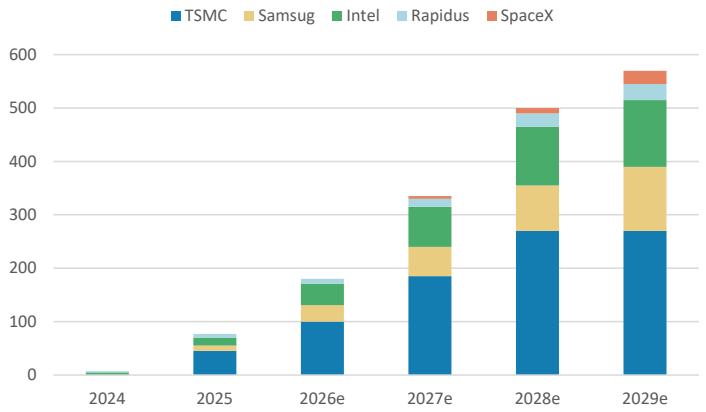
- **Intel:** At its latest earnings, Intel guided for 2027 capex to be “significantly above 2026 levels” and raised $20bn of equity.
- **NAND:** Following Kioxia’s K3 announcement and Solidigm’s Dalian expansion, NAND greenfield is appreciated.
- **DRAM:** memory makers are pulling forward capacity wherever possible and we model LAM/AMAT/TEL’s DRAM shipments to surpass $6bn in the DecQ as major fab projects start getting tooled out.

Our View

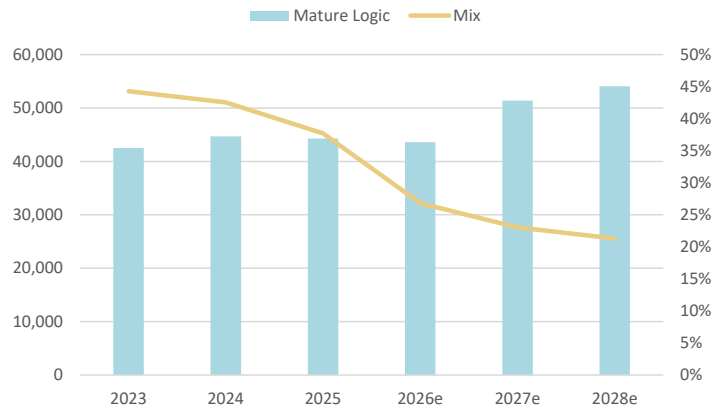
What’s left beyond “more capacity expansion”?

- We see several potential drivers that could add >1% ($2-3bn) to our WFE estimates, including TeraFab acceleration and a mature logic renaissance.
- **TeraFab:** We model approx. $2bn of TeraFab WFE in 2027/28 and $6bn in 2029.
- **Mature Logic:** We model mature logic to decline 2% in 2026 and grow 18% in 2027.

We model TeraFab to be a marginal contributor through 2029



Mature Logic hasn’t partaken in the AI build out (yet)



Source: Company Data, Morgan Stanley Research. e = Morgan Stanley Research estimates

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Debate 4: How do we see DRAM supply?

Context

The “bull cases” we had predicted have largely materialized.

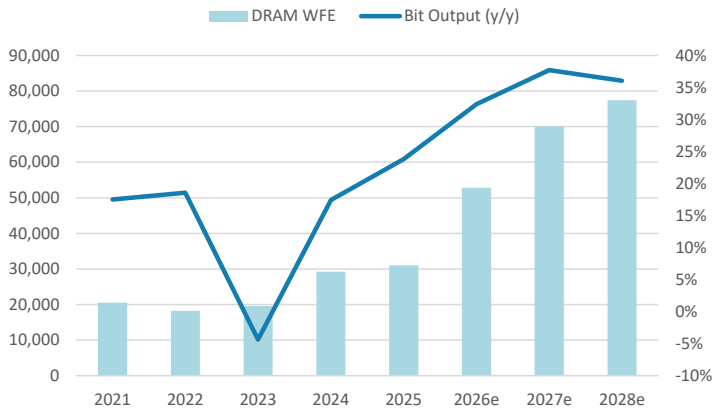
- DRAM bits have grown 36% YTD (Jun.) based on SIA, while TrendForce now forecasts 31% bit supply growth in 2026.
- Suppliers expect DRAM to track ahead of total WFE growth in 2027 which would imply $75bn+ (+40%y/y) vs $70bn (MSe)
- **Supply Growth (MSe):** We model 32%/38% bit supply growth in 2026/27, with HBM bits growing 55%/57%, and non-HBM bits growing 30%/36%.

Our View

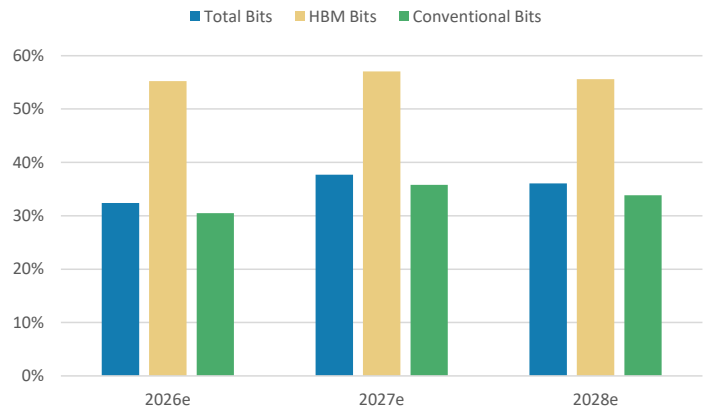
We’re not going to make a call on supply/demand dynamics

- **2027 DRAM TAM:** Assuming 10% ASP growth and 38% supply growth, we estimate DRAM TAM of $979bn (41% bit growth gets us to $1tn).
- **DRAM usage roadmaps are clearly shifting:** We aren’t making a call, we’re just saying “we’ve revised up our 2026 DRAM WFE forecast by 47% over the last 9-months” as customers have continued to absorb incr. tool capacity.

We model 32%/38% bit supply growth in 2026/27



We model HBM bit supply growth of 50%+ in 2027/28



Source: TrendForce, Company Data, Morgan Stanley Research. e = Morgan Stanley Research estimates.

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Debate 6: HBM de-spec

Context

HBM 12-high to 8-high

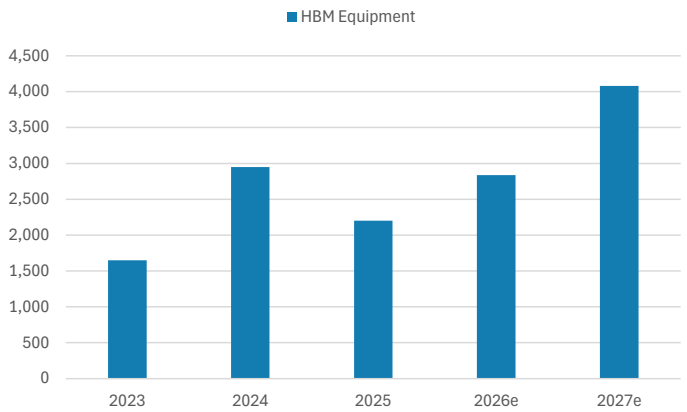
- Our Greater China semis team reported that Nvidia's Rubin Ultra will feature several SKUs with high-end versions adopting HBM4e 8Hi lower-end versions using HBM4 12Hi or 8Hi.
- A move from 12-High to 8-High, does not translate into a proportional reduction across process steps. "Stacking 12 DRAM chips (from 8-high), which are 40% thinner, with a 13% narrower gap than before made it difficult to maintain control of the chips and apply the original packaging process. "-SK Hynix

Our View

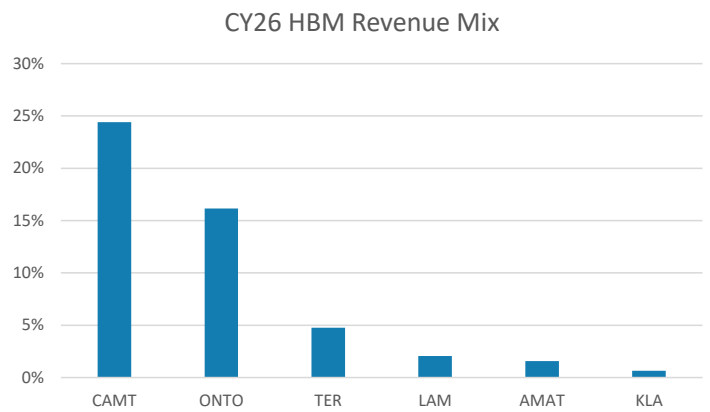
We think process control is most vulnerable

- We see the greatest downside risk in process control (bump inspection, bond interface, stack alignment, wafer warpage) and backside grinding/polishing.
- If the HBM roadmap doesn't scale to 16-high and beyond, we're unlikely to need hybrid bonding. In that case, process control intensity for HBM is unlikely to increase any further.

We assume $2bn of equipment per 100kwpm of HBM



HBM as a % of CY26 revenue (US SPE)



Source: Company Data, Morgan Stanley Research. e = Morgan Stanley Research estimates

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Debate 7: Sub-system vs OEM dislocation

Context

Inventory dynamics are different this cycle

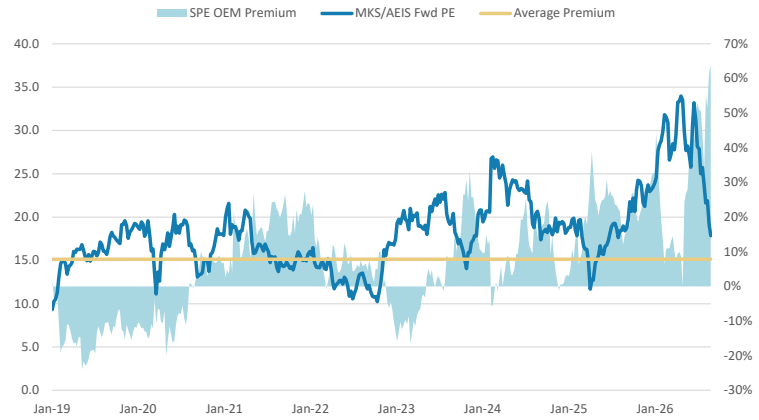
- AMAT & LAM's absolute inventory is up 8% over the last 2 quarters, but DOI is down 19 days as both companies have met customer expedites by drawing on their inventory. DOI is now at the lowest point since DecQ 2021.
- AMAT/LAM/KLA trade at a 64% premium to AEIS/MKS vs an avg. of 8% since 2019.

Our View

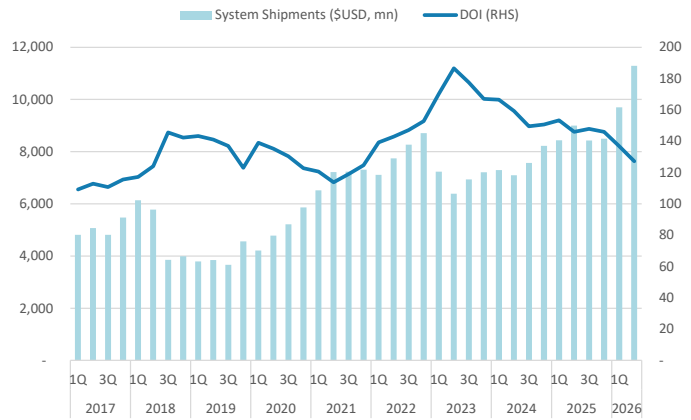
We think MKS/AEIS are mispriced

- This cycle should be different for the sub-systems as AEIS/MKS will undergrow AMAT/LAM in 2026, unlike the prior cycle when subsystem growth was amplified by OEM inventory builds.
- When the cycle slows, AMAT/LAM won't have any AEIS/MKS inventory to deplete, reducing the risk of the subsystem inventory whiplash seen last cycle.
- Yet, AEIS/MKS are trading like "early-cycle" stocks being valued on CY27 vs the OEMs on CY28. We think that disconnect is mispriced, because the inventory unwind that drove prior-cycle subsystem underperformance is unlikely to repeat to the same extent.

AEIS/MKS are trading at a historic high discount to SPE OEMs



AMAT/LAM's DOI is closing to 2021 cycle lows (127 vs 114)



Source: Factset, Company Data, Morgan Stanley Research. e = Morgan Stanley Research estimates

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(as of August 31, 2026)

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	Coverage Universe		Investment Banking Clients (IBC)			Other Material Investment Services Clients (MISC)	
Stock Rating Category	Count	% of Total	Count	% of Total IBC	% of Rating Category	Count	% of Total Other MISC
Overweight/Buy	1555	42%	450	48%	29%	767	44%
Equal-weight/Hold	1577	43%	395	42%	25%	770	44%
Not-Rated/Hold	3	0%	1	0%	33%	1	0%
Underweight/Sell	559	15%	93	10%	17%	216	12%
Total	3,694		939			1754	

Data include common stock and ADRs currently assigned ratings. Investment Banking Clients are companies from whom Morgan Stanley received investment banking compensation in the last 12 months. Due to rounding off of decimals, the percentages provided in the "% of total" column may not add up to exactly 100 percent.

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COMPANY (TICKER)	RATING (AS OF)	PRICE* (09/04/2026)
Shane Brett		
Advanced Energy Industries Inc. (AEIS.O)	O (07/22/2026)	$274.30
Applied Materials Inc. (AMAT.O)	E (05/18/2026)	$435.91
Camtek (CAMT.O)	E (12/01/2025)	$138.90
KLA Corp (KLAC.O)	O (01/15/2026)	$172.94
Lam Research Corp (LRCX.O)	O (05/18/2026)	$292.66
MKS Inc. (MKSI.O)	O (08/04/2024)	$249.65
Nova Ltd (NVMI.O)	E (12/01/2025)	$352.70
ONTO Innovation Inc (ONTO.N)	O (06/14/2026)	$268.01
Teradyne Inc (TER.O)	E (07/30/2025)	$338.59

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* Historical prices are not split adjusted.

INDUSTRY COVERAGE: Semiconductors

COMPANY (TICKER)	RATING (AS OF)	PRICE* (09/03/2026)
Joseph Moore		
Advanced Micro Devices (AMD.O)	E (06/09/2024)	$456.16
Aeva Technologies Inc (AEVA.O)	E (07/19/2021)	$15.26
Allegro Microsystems Inc (ALGM.O)	O (02/13/2026)	$35.56
Ambarella Inc (AMBA.O)	O (03/29/2016)	$63.38
Amkor Technology Inc (AMKR.O)	E (11/08/2023)	$46.94
Analog Devices Inc. (ADI.O)	O (11/16/2023)	$356.50
Astera Labs Inc (ALAB.O)	O (05/11/2025)	$282.82
Broadcom Inc. (AVGO.O)	O (06/09/2024)	$357.16
Cerebras Systems (CBRS.O)	O (06/08/2026)	$190.44
GlobalFoundries Inc (GFS.O)	E (10/28/2024)	$44.53
Intel Corporation (INTC.O)	E (02/22/2023)	$91.67
IonQ Inc (IONQ.N)	E (04/25/2023)	$39.52
Marvell Technology Group Ltd (MRVL.O)	E (09/14/2015)	$208.83
Microchip Technology Inc. (MCHP.O)	E (07/10/2024)	$73.11
Micron Technology Inc. (MU.O)	O (10/06/2025)	$958.16
Navitas Semiconductor Corp (NVTS.O)	U (04/06/2025)	$11.10
NVIDIA Corp. (NVDA.O)	O (03/16/2023)	$228.45
NXP Semiconductor NV (NXPI.O)	O (02/11/2025)	$224.99
ON Semiconductor Corp. (ON.O)	++	$73.65
Qorvo Inc (QRVO.O)	E (10/28/2025)	$100.38
Qualcomm Inc. (QCOM.O)	E (06/24/2026)	$168.57
Quantinuum (QNT.O)	E (06/29/2026)	$48.70
SanDisk Corporation. (SNDK.O)	O (03/03/2025)	$1,554.99
Semtech Corp. (SMTC.O)	E (04/06/2025)	$135.40
Silicon Laboratories Inc. (SLAB.O)	E (01/19/2021)	$220.71
Skyworks Solutions Inc (SWKS.O)	E (11/28/2018)	$71.50
Texas Instruments (TXN.O)	U (04/13/2020)	$253.83
Wolfspeed, INC (WOLF.N)	NR (04/06/2025)	$28.35
Lee Simpson		
Arm Holdings plc (ARM.O)	E (04/07/2026)	$242.59
Cadence Design Systems Inc (CDNS.O)	O (02/14/2024)	$304.88
Synopsys Inc. (SNPS.O)	E (02/27/2026)	$416.31

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