KLA (KLAC)

> ⚠ **Too far outside sweet spot**
>
> However, understanding KLA is essential for evaluating the competitive positioning of other companies.

Category: Inspection & Metrology (Front-End)
Est. Price Per Unit: $5M - $10M+ per tool

What They Do

Product 101 and Where They Fit into the AI Stack

- KLA is the dominant player in **semiconductor process control and yield management**—the "MRI for chips." They have ~55-65% of the overall inspection/metrology market and 75-80% in patterned wafer inspection.
- The core problem: as chips shrink and complexity grows, microscopic defects become yield killers. A single particle can ruin an expensive AI chip. KLA detects defects during manufacturing so fabs can fix process issues before ruining wafer lots.
- They provide end-to-end process control across the fab:
  - Reticle inspection: checking the photomask before it patterns thousands of wafers
  - Patterned wafer inspection: optical systems (2900 Series, Puma) for high-speed full-wafer coverage
  - E-beam inspection (eSL10): nanometer-scale precision for electrical defects invisible to optical. KLA gained 700 bps of e-beam share in 2024—revenues doubled YoY
  - Metrology: film thickness, critical dimension, overlay accuracy
- Advanced packaging revenue surged from ~$500M in 2024 to projected $925M+ in 2025 (~85% growth). This is where they intersect with Camtek's territory.

Alignment with Overall Thesis

- As AI chips become more expensive, the cost of a defective chip skyrockets. KLA tools are no-regrets purchases for fabs maximizing yield.

- Sub-7nm processes, 3D architectures, and advanced packaging all increase defect sensitivity. More process steps = more inspection = more KLA revenue.
- KLA benefits from the same HBM/memory stacking trends as Camtek, just at an earlier stage of the fab.

Business Model, Customers

- $5M-$10M+ per tool (significantly more expensive than Camtek's ~$1M systems).
- Yield management purchasing dynamic—bought when defect rates are too high. Scales with complexity.
- Customers are leading-edge logic fabs (TSMC, Intel, Samsung) and memory IDMs. Tool of record at virtually every advanced fab.
- ~30% recurring revenue from services and upgrades.

Comments on Team

- Founded in 1975; founder retired but is Chairman Emeritus.
- CEO Rick Wallace has been with KLA since 1988.
- Professional management, not founder-led. Execution-focused with strong capital return discipline.

Early View of Moat Hypothesis

- Algorithms are the moat. High resolution isn't enough—you need algorithms that separate defects from noise. KLA's AI-augmented inspection is decades of data and iteration. Hard to replicate.
- Fabs build process recipes around KLA tools. Switching costs are enormous.
- ~$1B+/year on R&D. Smaller competitors can't match portfolio breadth.

Why They're Interesting, and Why Now

- KLA is the benchmark against which smaller players (Camtek, Onto) are measured. Understanding KLA helps us understand where smaller players can win.
- Bull case: AI complexity increases, yield becomes more critical, advanced packaging grows, e-beam gains continue.

Key Risks

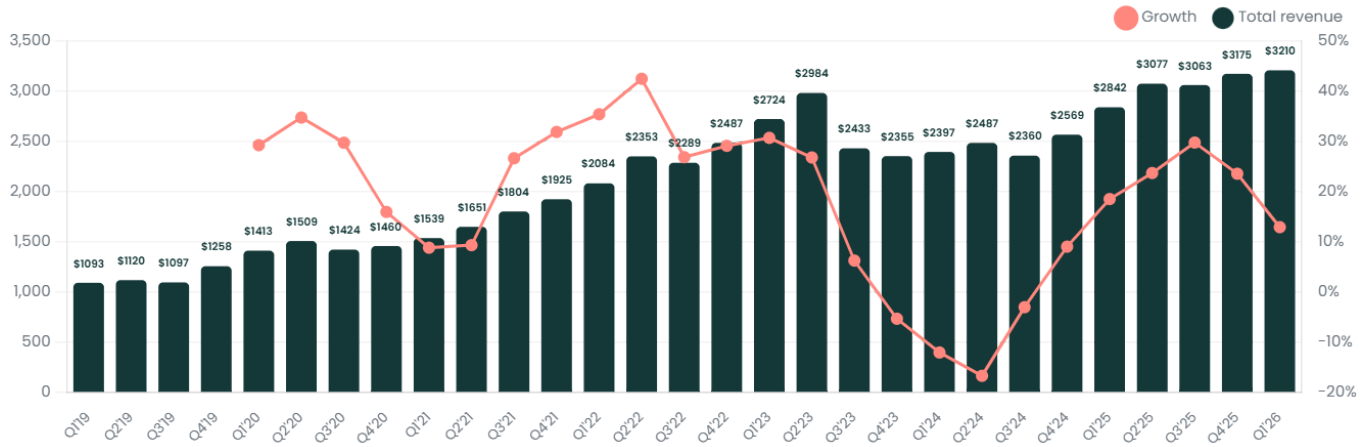
- Priced for perfection. Any miss hurts.
- China exposure—geopolitical restrictions on equipment sales.
- Camtek, Onto gaining share in packaging inspection where KLA is pushing to expand.

Gaps in Understanding / Key Questions

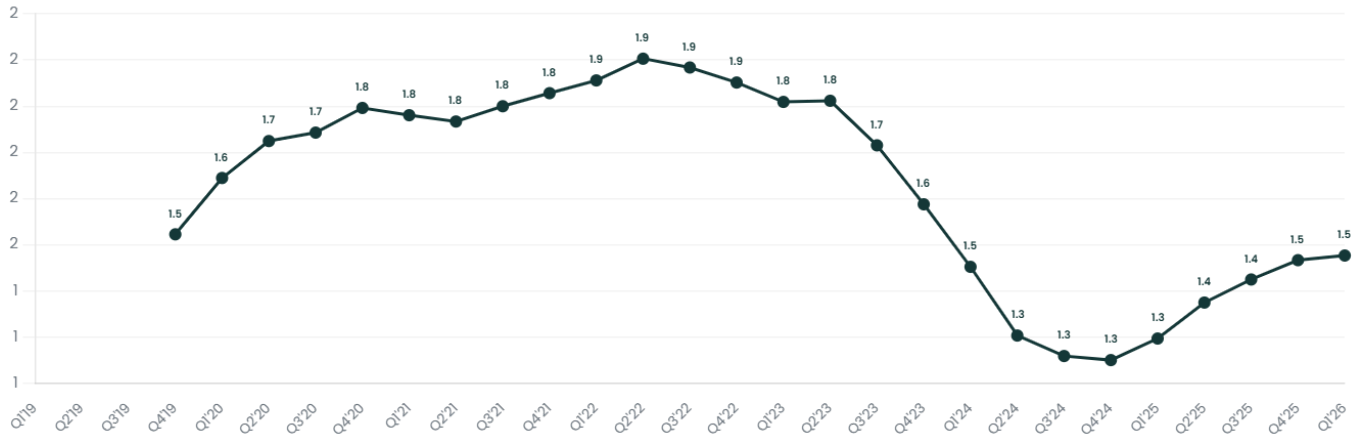
- How much of advanced packaging growth is greenfield vs. taking share from Camtek/Onto?
- Is e-beam inspection becoming commoditized or is KLA's lead durable?
- What's the actual overlap with Camtek in HBM? Complementary or competitive?

Select Financial Graphs

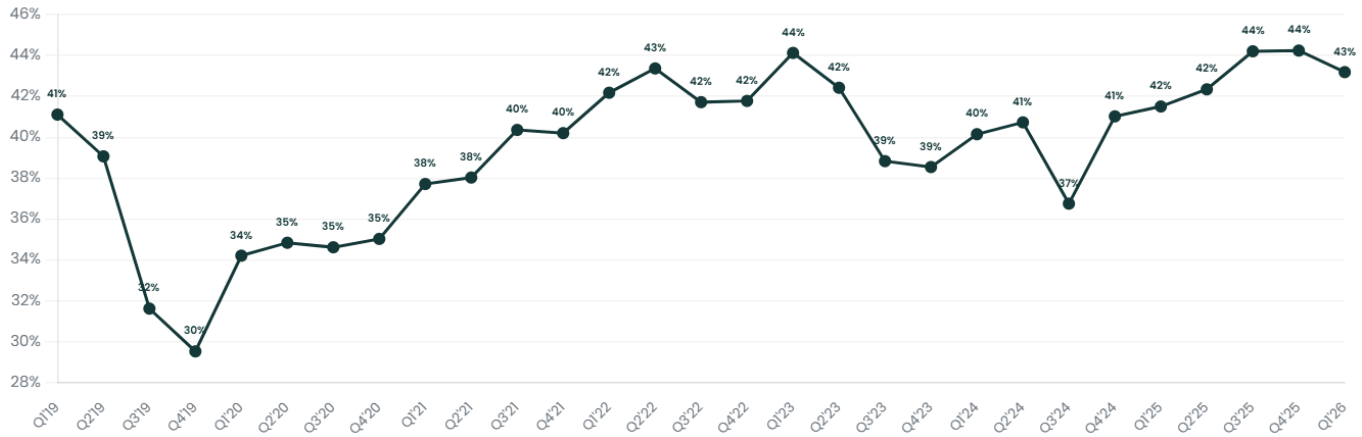
R1: Total Revenue & YoY Growth



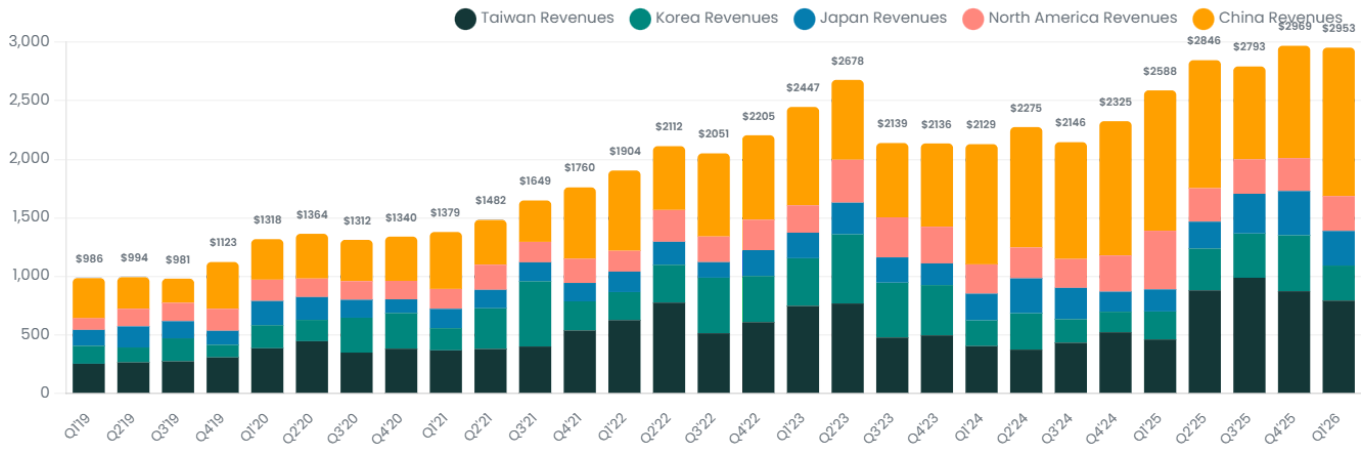
I1: Inventory Turns



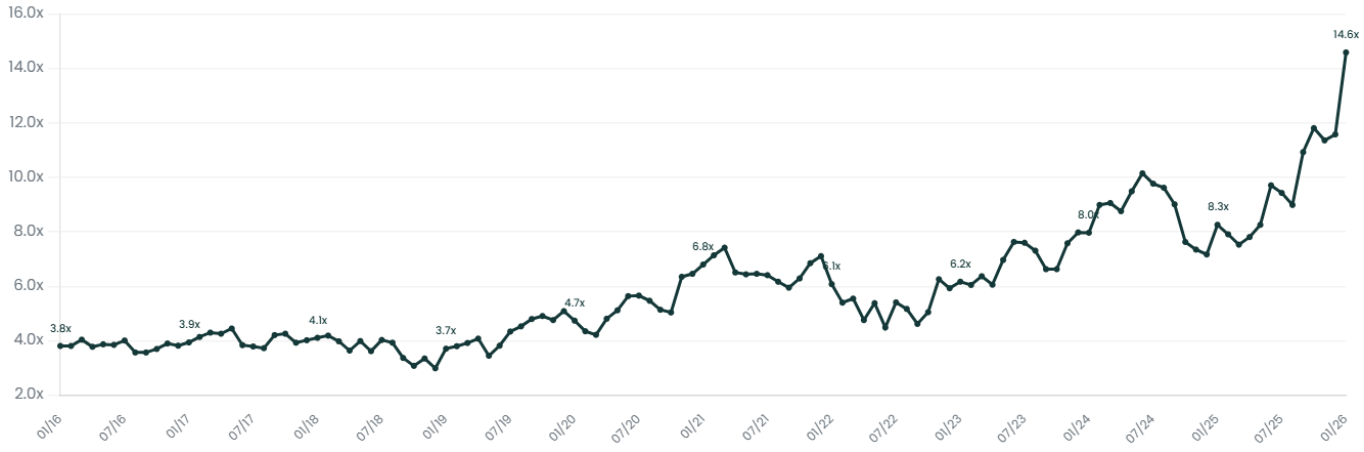
P3: EBIT Margin



S5: Revenue by Geography



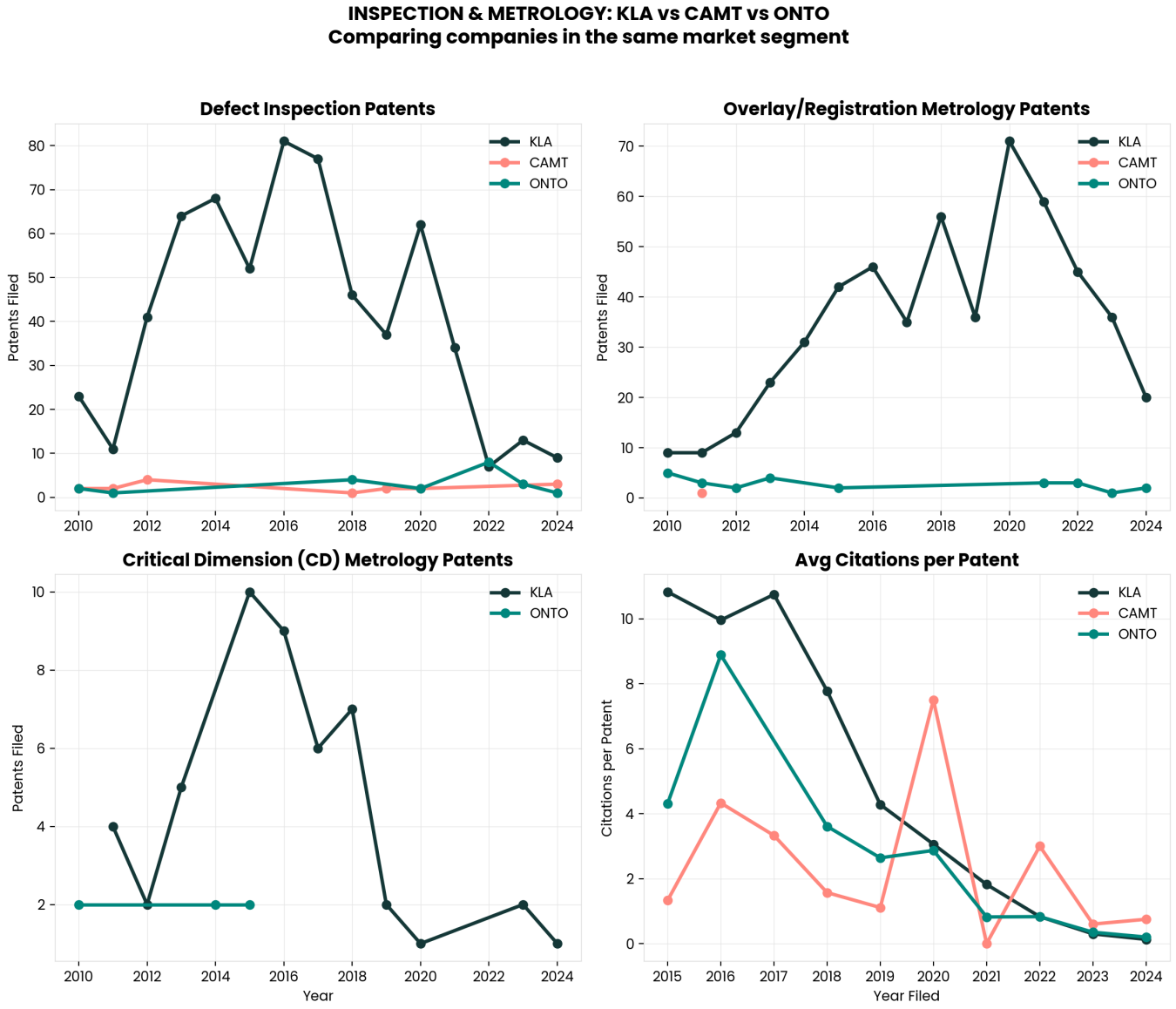
V1: EV/Sales NTM



Patent Analysis

Inspection & Metrology Dominance

KLA's patent volume dwarfs Camtek and Onto across all inspection categories. This is the R&D moat in action—smaller players can't match the breadth.



Interesting Topics to Read

- KLA vs. Camtek vs. Onto Innovation competitive positioning
- E-beam inspection vs. optical inspection trade-offs
- Yield learning and process control in advanced nodes
- KLA's AI-augmented defect classification (SMARTs™)
- Advanced packaging inspection market dynamics