LIGHTWAVELOGIC®

Investor Presentation

December 2025

Forward Looking Statements

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This slide presentation contains “forward-looking statements” and “forward-looking information” within the meaning of the Private Securities Litigation Reform Act of 1995. This information and these statements, which can be identified by the fact that they do not relate strictly to historical or current facts, are made as of the date of this presentation or as of the date of the effective date of information described in this presentation, as applicable. The forward-looking statements herein relate to predictions, expectations, beliefs, plans, projections, objectives, assumptions or future events or performance (often, but not always, using words or phrases such as “expects”, “anticipates”, “plans”, “projects”, “estimates”, “envisages”, “assumes”, “intends”, “strategy”, “goals”, “objectives” or variations thereof or stating that certain actions, events or results “may”, “can”, “could”, “would”, “might” or “will” be taken, occur or be achieved, or the negative of any of these terms and similar expressions) and include, without limitation, statements with respect to projected financial targets that the company is looking to achieve.

All forward-looking statements are based on current beliefs as well as various assumptions made by, and information currently available to the company’s management team. A more detailed description of the risks presented by those assumptions and other risks are more fully described by the company under the caption “Risk Factors” included in our SEC filings and other risks to which our company is subject, and various other factors beyond the company’s control.

By their very nature, forward-looking statements involve inherent risks and uncertainties, both general and specific, and risks exist that estimates, forecasts, projections and other forward-looking statements will not be achieved or that assumptions do not reflect future experience. We caution any person reviewing this presentation not to place undue reliance on these forward-looking statements as a number of important factors could cause the actual outcomes to differ materially from the beliefs, plans, objectives, expectations, anticipations, estimates assumptions and intentions expressed in such forward-looking statements.

The company does not undertake to update any forward-looking statement, whether written or oral, that may be made from time to time by company or on behalf of the company except as may be required by law.

Imagine a flashlight turning on and off
100 billion times per second

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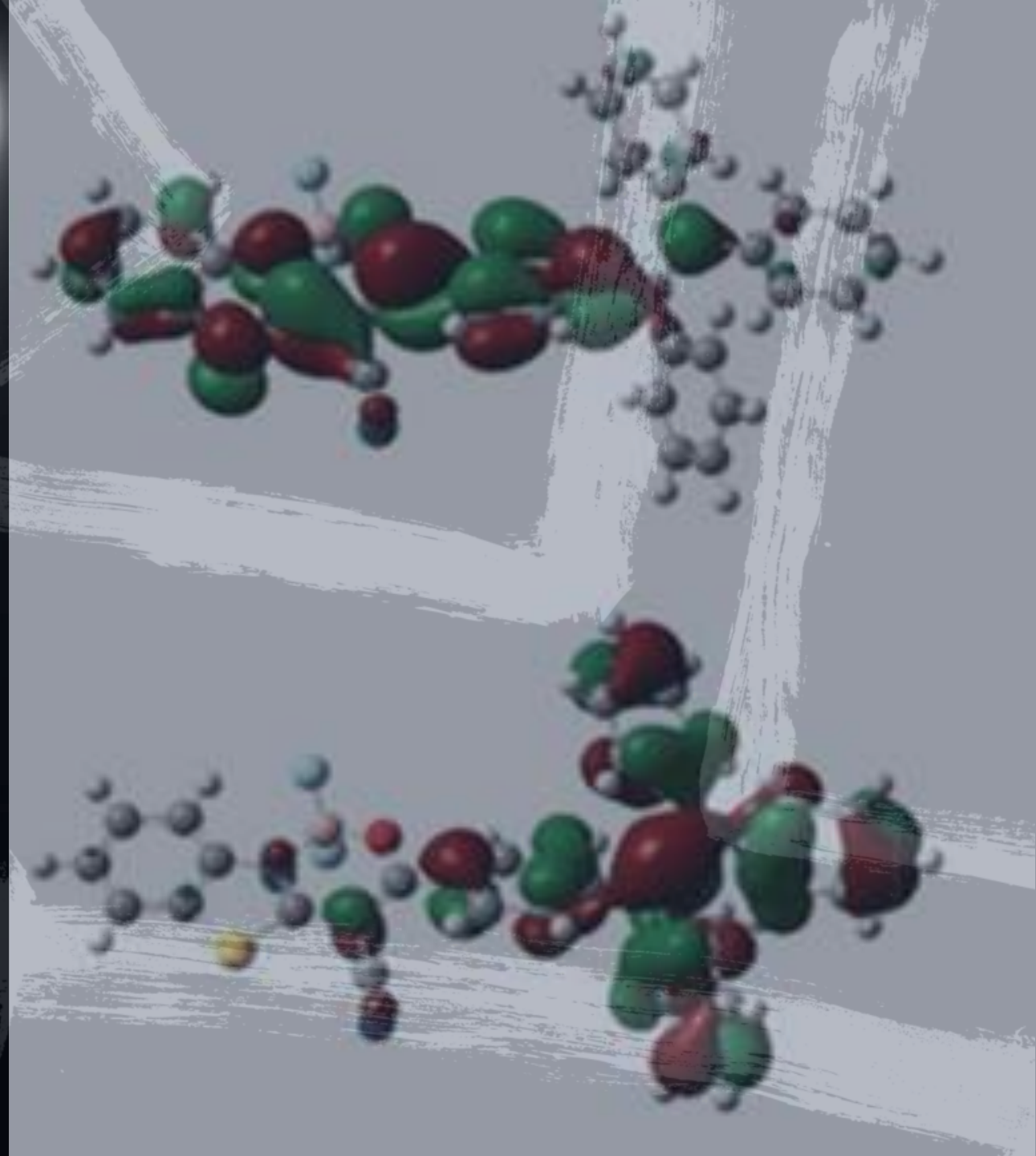
Perkinamine®
The Fastest Electro-optics Material



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AI Infrastructure Facing New Challenges

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- BANDWIDTH
- CONNECTIVITY
- POWER
- INTEGRATION

AI Cluster Opportunity

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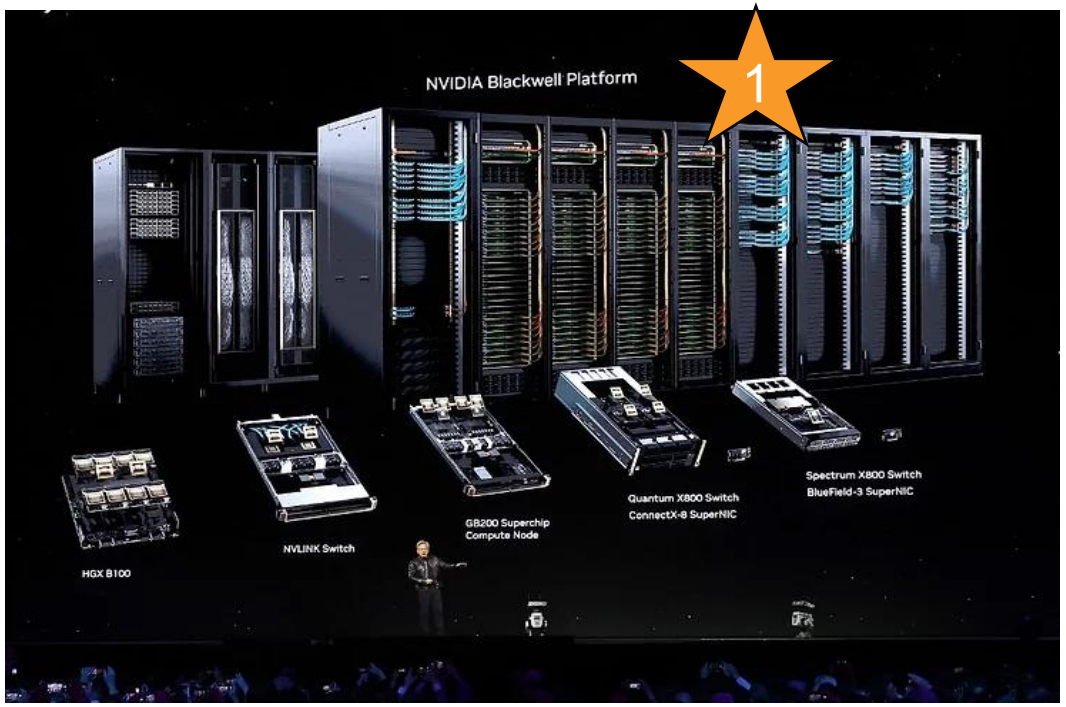
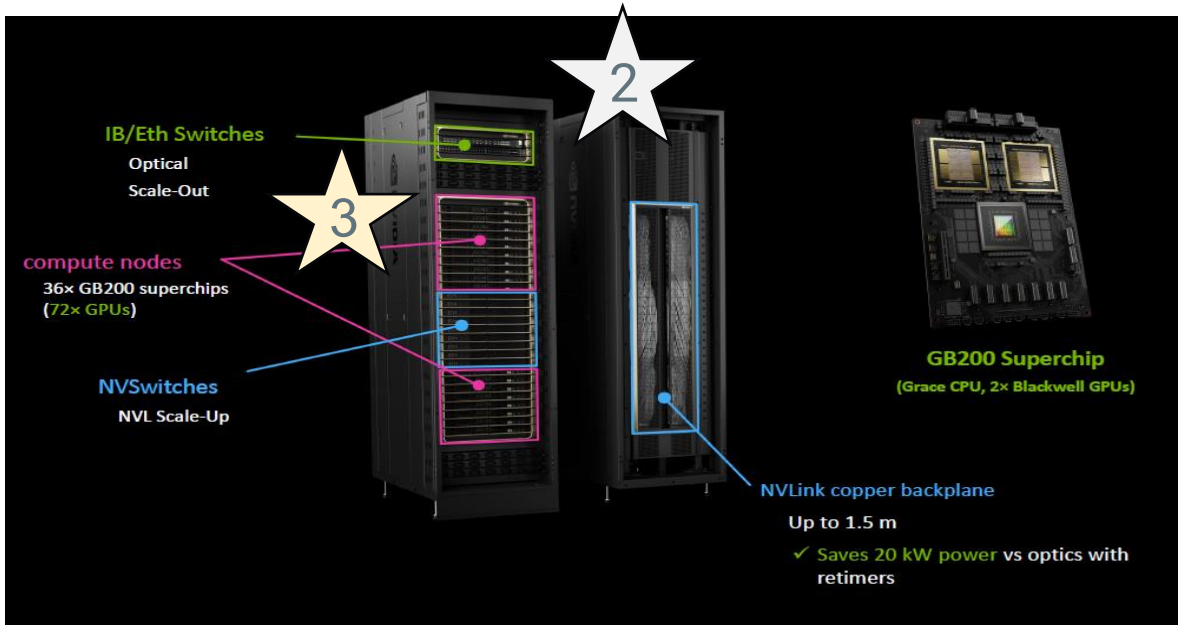
Scale Out – Switch Rack to Switch Rack interconnect using optics (transceiver based)



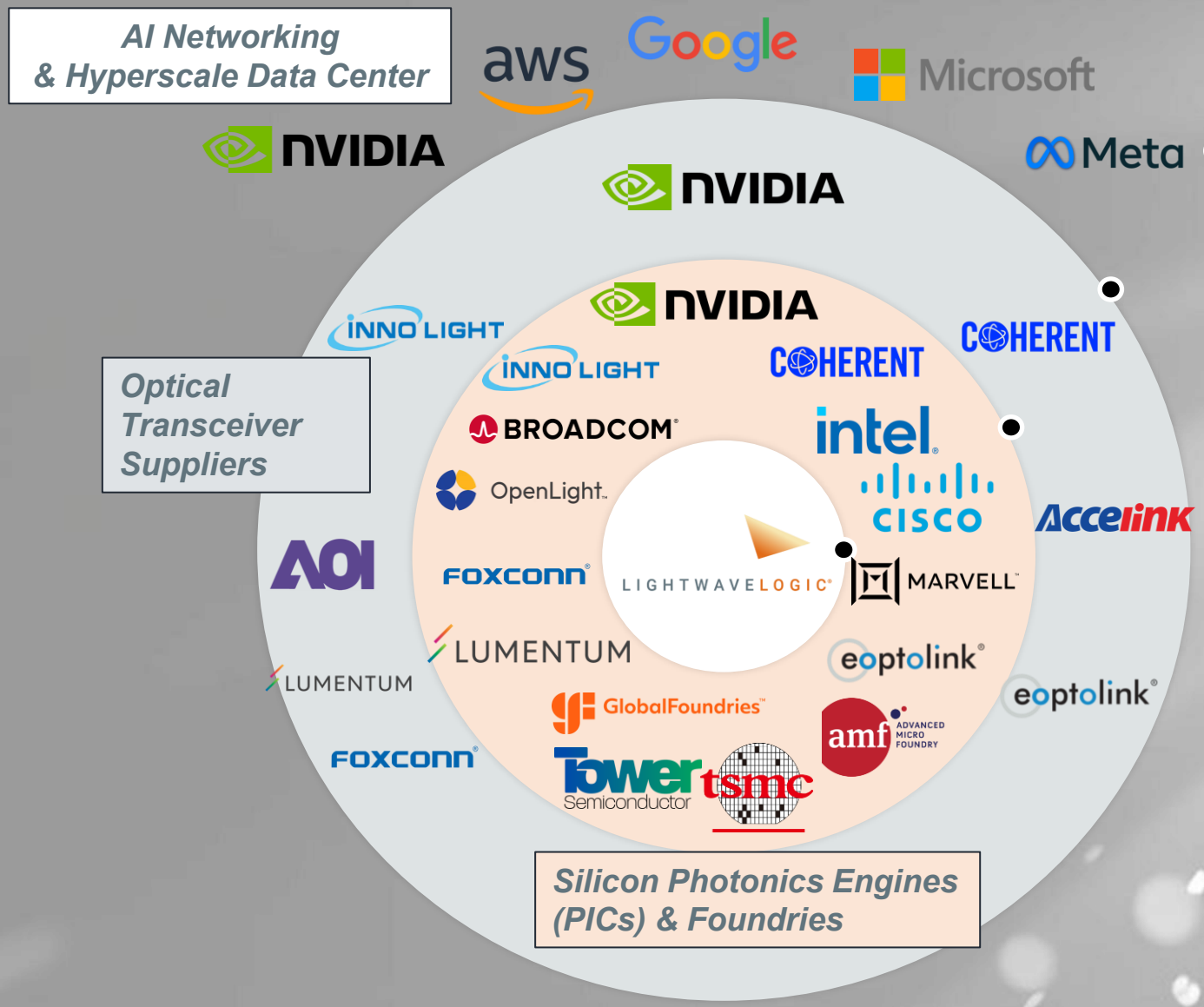


Scale Out – GPU rack to Switch rack connectivity – migrating to optical cables/CPO

Scale Up – GPU to GPU connectivity – PCB traces migrating to CPO/optical chiplets

Source: Nvidia

Enabling AI Connectivity Ecosystem



Note: Companies represent examples of established entities per segment only.

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Silicon Photonics for AI Scale Up and Scale Out
200G and 400G speeds needed for $15B Opportunity in 2030

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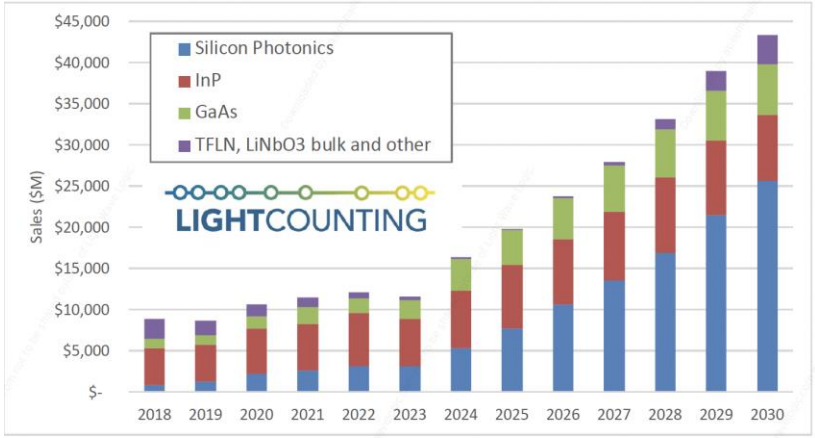
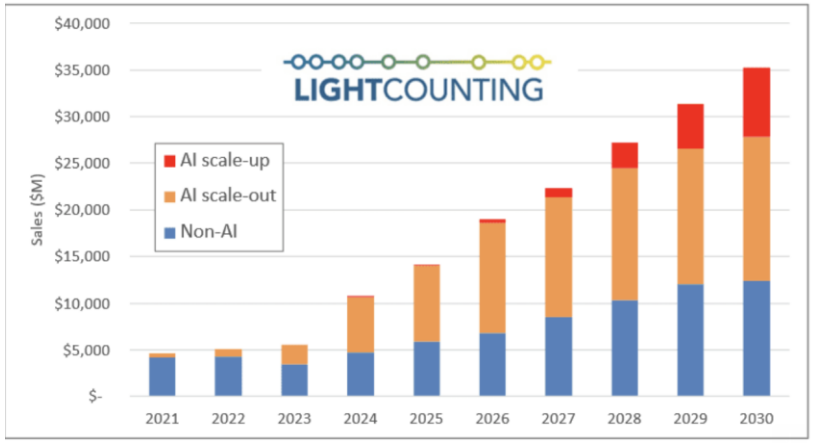
Sales of optical transceivers by technology

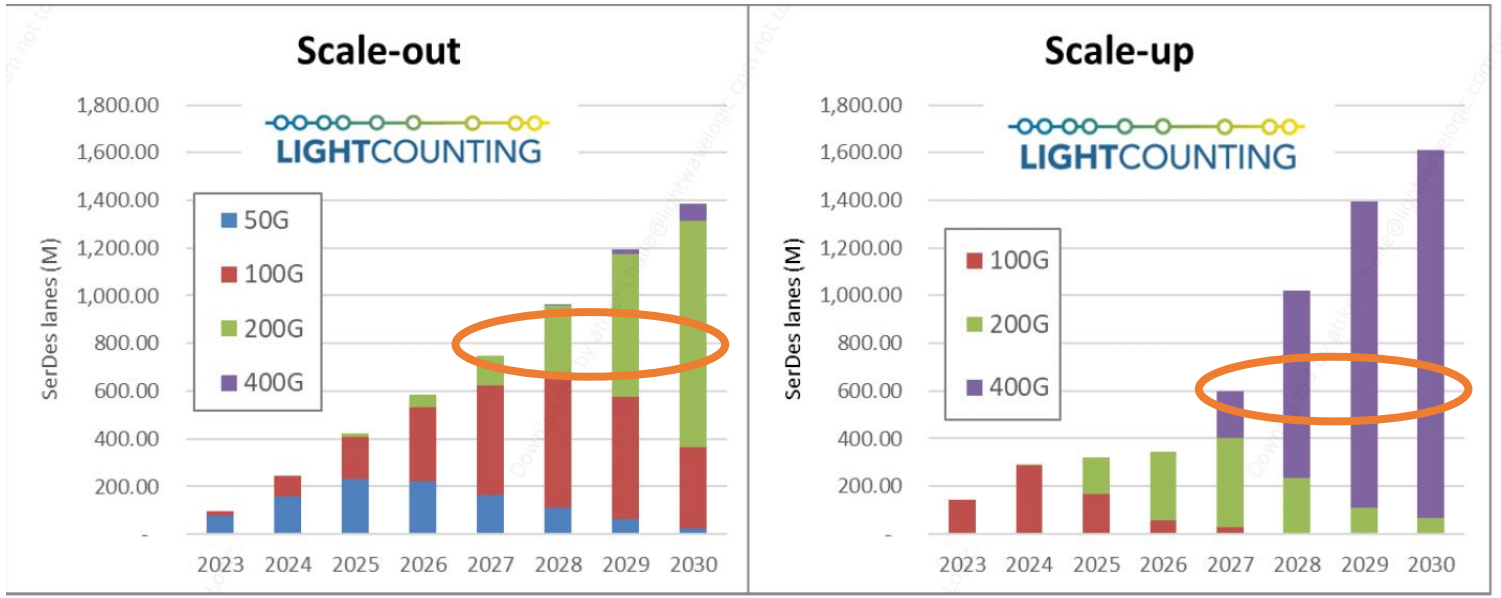


Source: LightCounting



Source: LightCounting

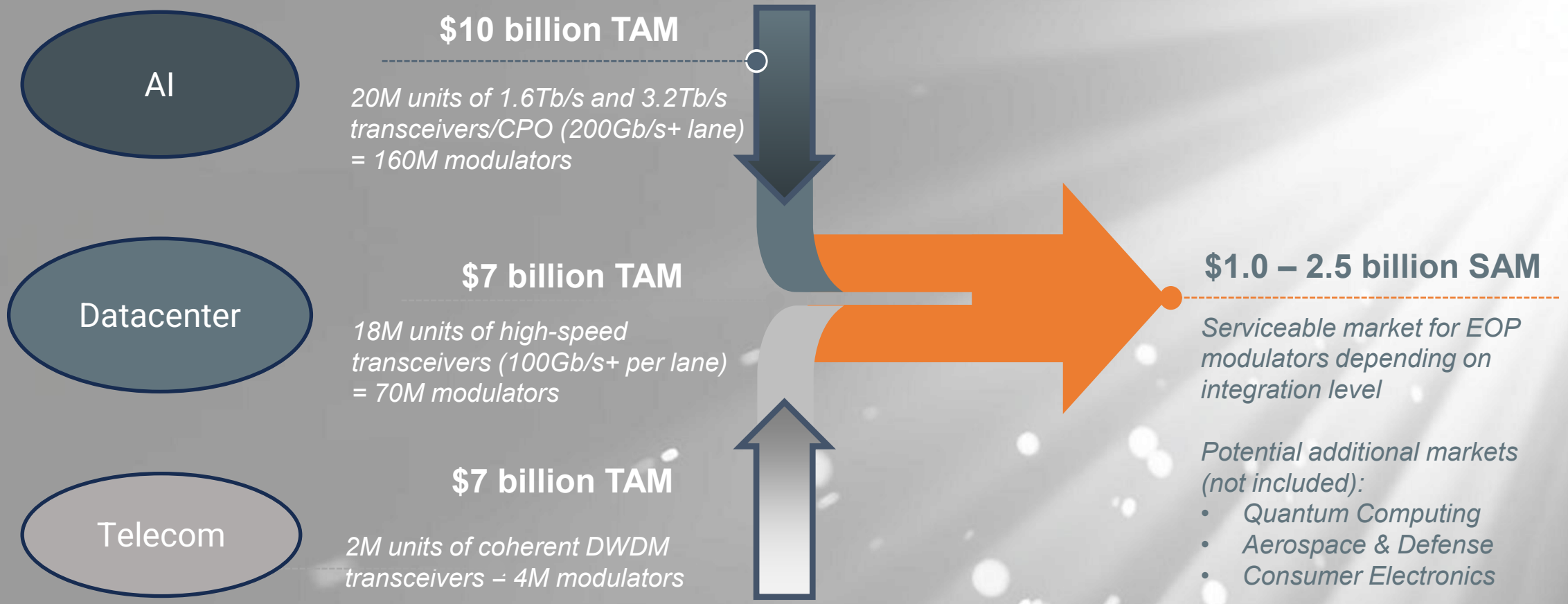
SERDES Speeds Transition



Source: LightCounting

- 200G Scale out and 400G Scale up Photonics needed in 2027 timeframe
- Traditional SiPh needs to be augmented to reach 400G – and improve 200G performance
- EO Polymers offer viable path compatible with standard CMOS processing and assembly

2028 Estimated Total Addressable Market (TAM) & Serviceable Addressable Market (SAM)*



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* Source: LightCounting, internal company estimates

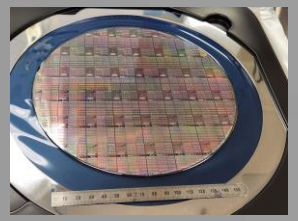
Our Business Model
Material + IP/Royalty Licensing Company

Foundational E/O Polymer R&D…

…For Creating Next-Gen Optical Modulators

…And Generating High Margin Revenues

E/O Polymer Composition & IP → **E/O Polymer Production** → **Material Sales**



Reference Designs & Polymer "PDK" IP → **IP & "PDK" Licensing & "Co-Design" Capability** → **Licensing &/or Royalty Fees**

60%+

Gross Margin at Scale

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Stage 1
Complete

Technology & Materials Development

Patents/IP, Polymers, Factory and Process

Stage 2
2025 + 2026

Customers & Products

Product Design-ins

Silicon Photonics Foundries

AI Ecosystem Integration

Stage 3
Starting 2026

Scale-up & Diversification

Production infrastructure
+
New markets and applications

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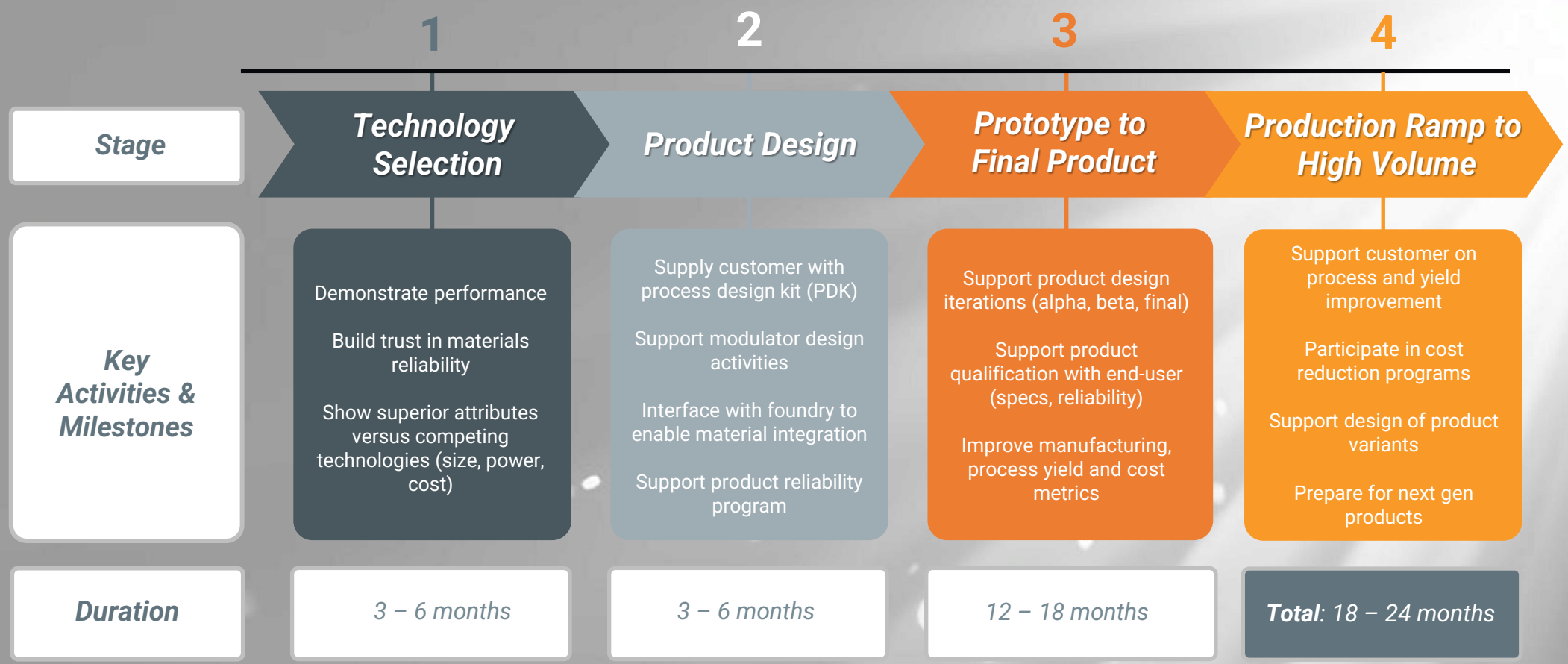
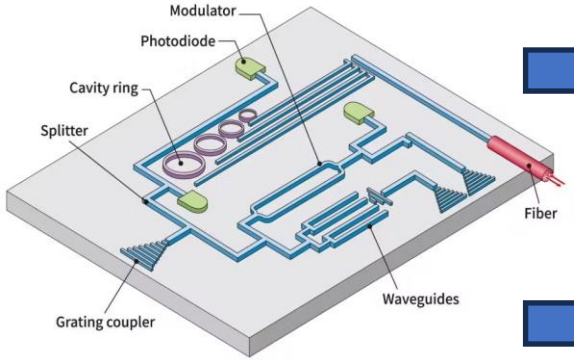
Design Win Cycle

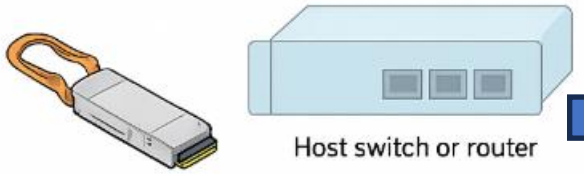


Reaffirming expectation to have 3-5 customers in Stage 3 by year-end 2025

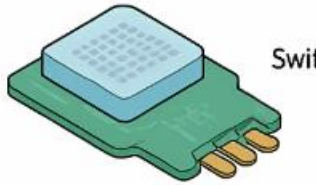
The Product Design Process



Optical Transceiver Modules



Co-Packaged Optics (CPO)



Perkinamine EO Polymer → Silicon Photonics PIC (Photonics Integrated Circuit) → Integrated Optical Module → Datacenter or AI Factory

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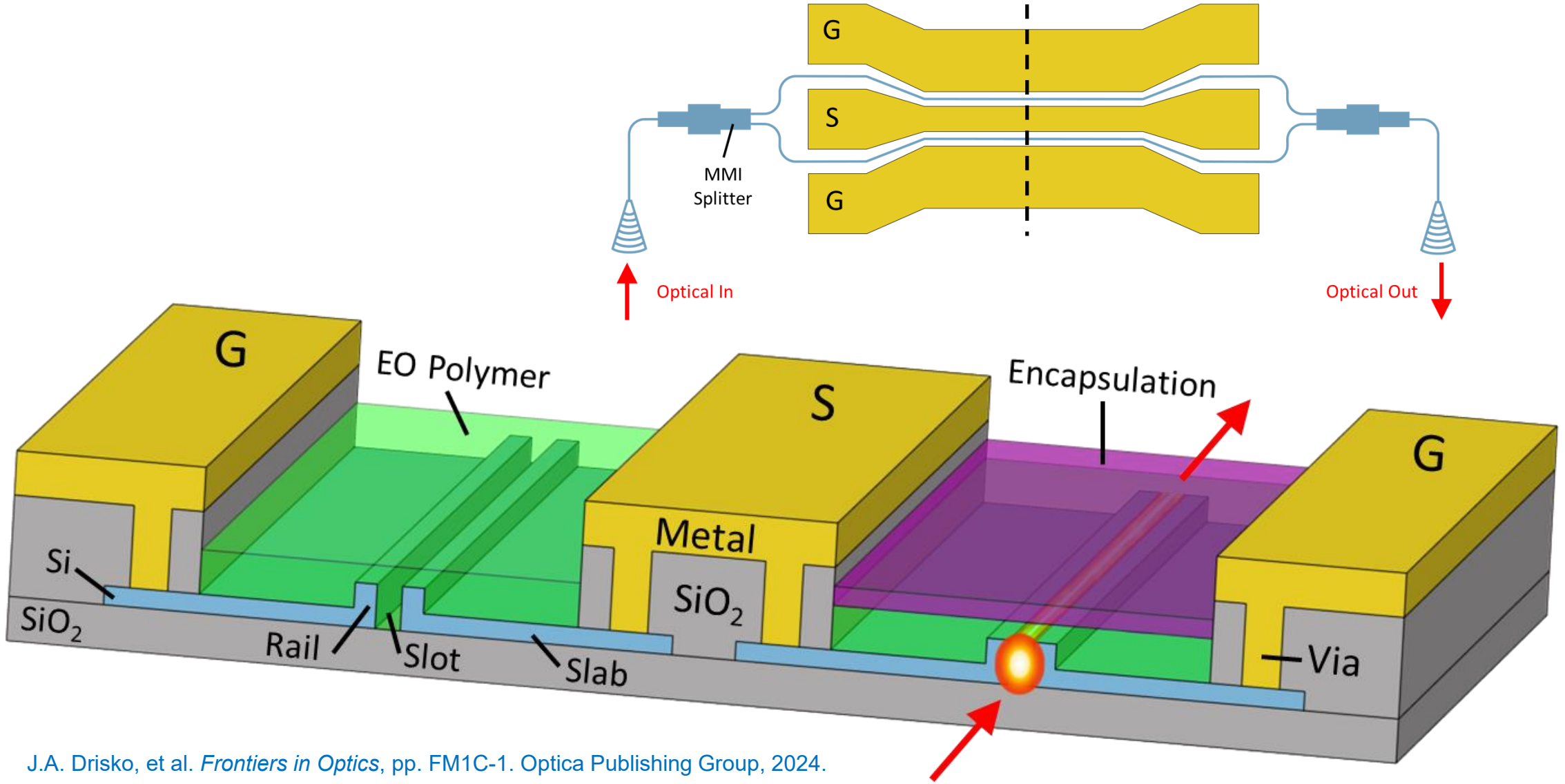
MARVELL · INNO LIGHT · intel · BROADCOM · Google · NVIDIA

COHERENT · LUMENTUM · INNO LIGHT · BROADCOM · NVIDIA

Google · aws · NVIDIA · Microsoft · Meta

Note: Companies represent examples of established entities per segment only.

Polymer Slot Modulators



J.A. Drisko, et al. *Frontiers in Optics*, pp. FM1C-1. Optica Publishing Group, 2024.

Si Slot Waveguide Cross Sections

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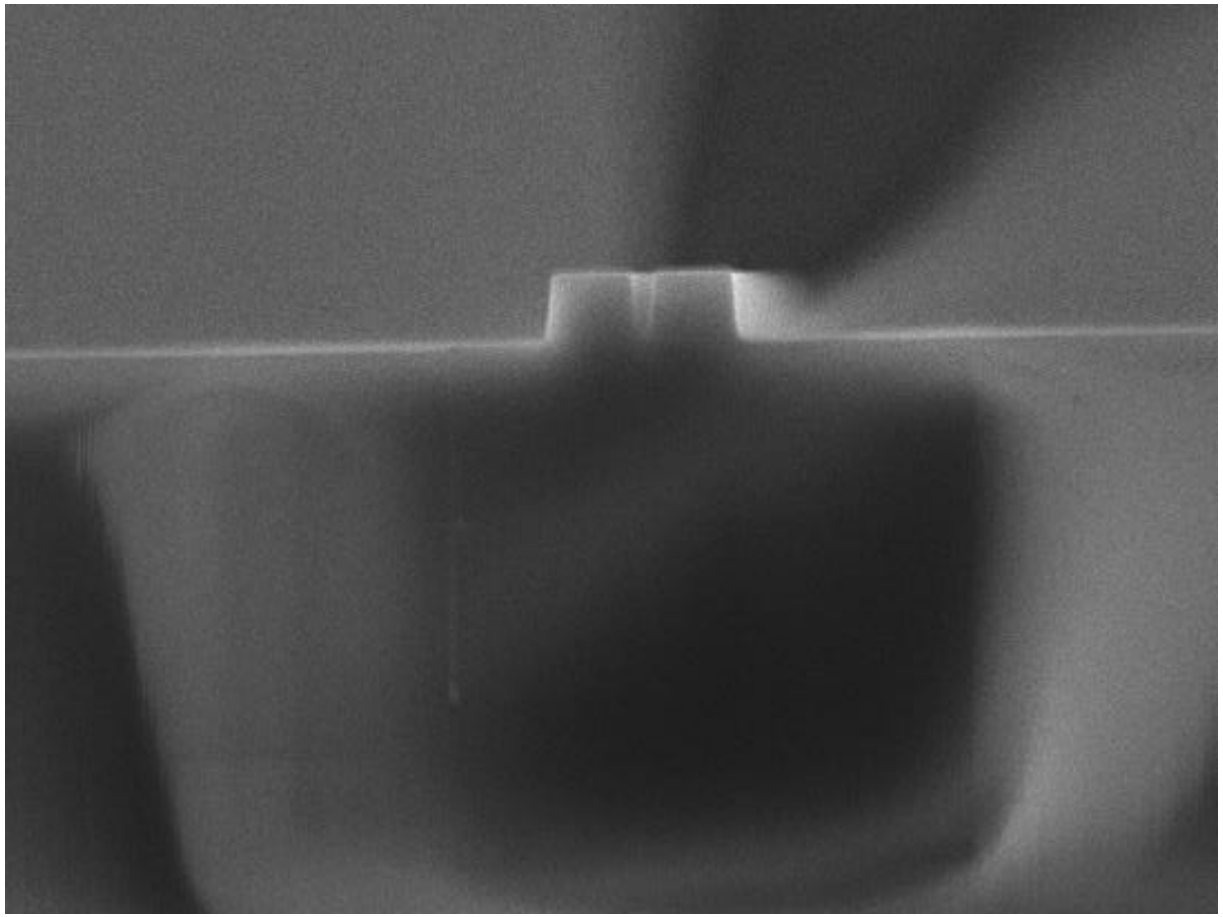
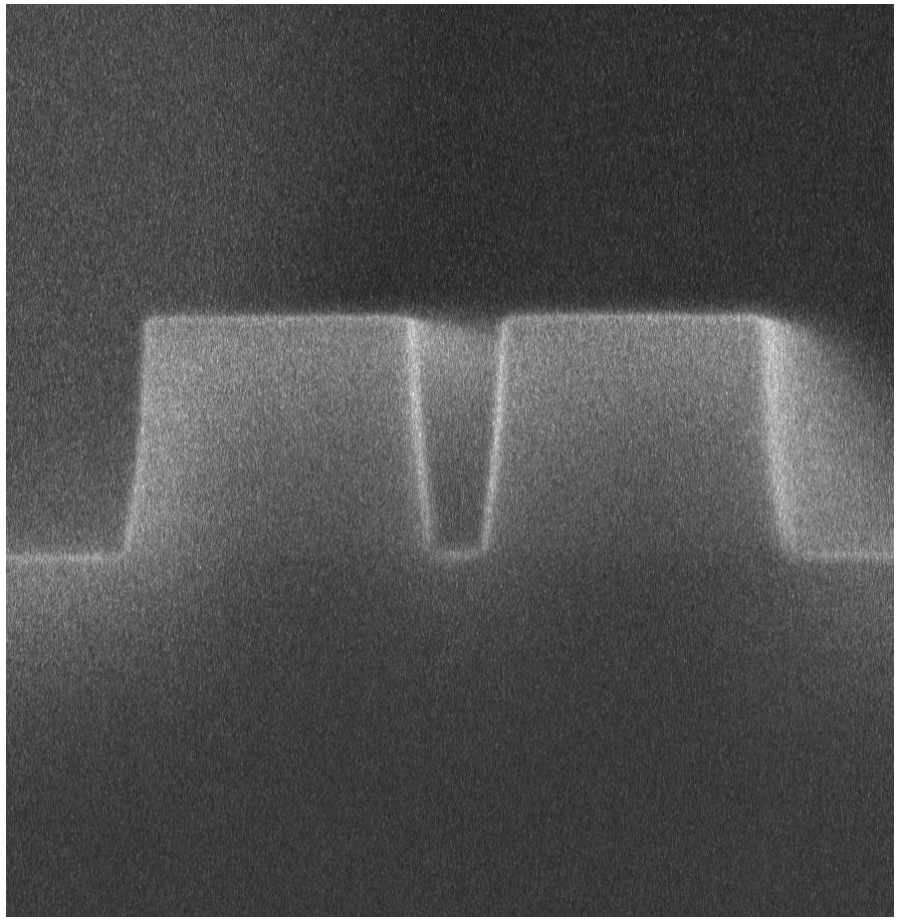


500 nm



100 nm

Clean, sharp, and smooth Si slots

Electro-Optic Polymers (EOPs) - Perkinamine®

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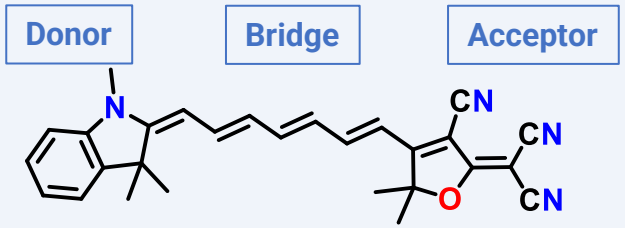
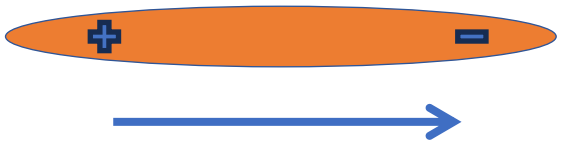
General chromophore structure

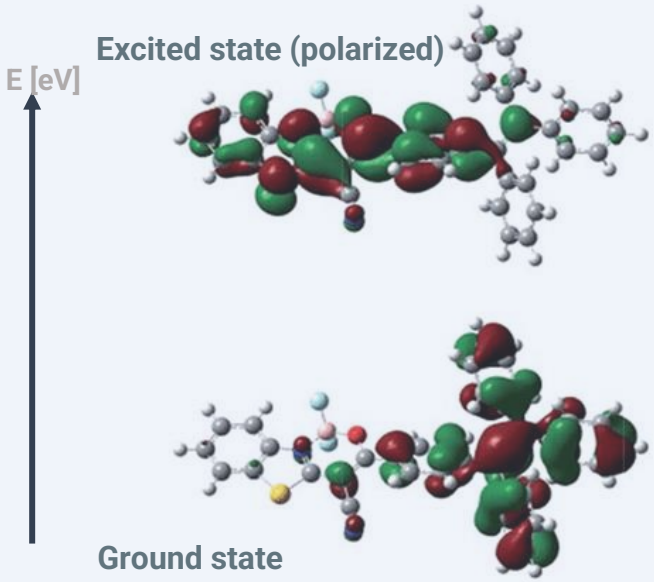


Chromophores are dipolar molecules



Pockels Effect:

- Linear electro-optic effect with the fastest response time
- Refractive index change directly proportional to applied electric field
- Occurs in non-centrosymmetric materials



The electric field shifts the electron cloud to the excited-state molecular orbitals.
This alters the refractive index of the electro-optic material, which in turn causes a phase change to any transiting optical signal

EOPs: Index change proportional to applied field with the fastest response time

RSC Adv.. 7. 1348-1356. 10.1039/C6RA25871A.

Comparison of Key Modulator Technologies

LWLG EO polymers have inherently high performance and are fully Si-foundry compatible

	LIGHTWAVELOGIC® Silicon Organic Hybrids (SiPh+EOP)	Thin Film Lithium Niobate (TFLN)	Silicon Photonics (SiPh)		Indium Phosphide (InP)	
Modulator Type	**MZ or Ring**	**MZ**	**Ring**	**Mach-Zehnder (MZ)**	**DFB-MZ**	**Diff EML**
Modulation Speed	●	●	●	●	●	●
Power Consumption	●	●	●	●	●	●
Drive Voltage (at 200G)	●	●	●	●	●	●
Size	●	●	●	●	●	●
Cost	●	●	●	●	●	●
Reliability	●	●	●	●	●	●
Bias Drift / Control complexity	●	●	●	●	●	●
Ease of Integration / Scalability / 300mm Compatible	●	●	●	●	●	●

Incumbent Technologies

CMOS Compatible Process Flow

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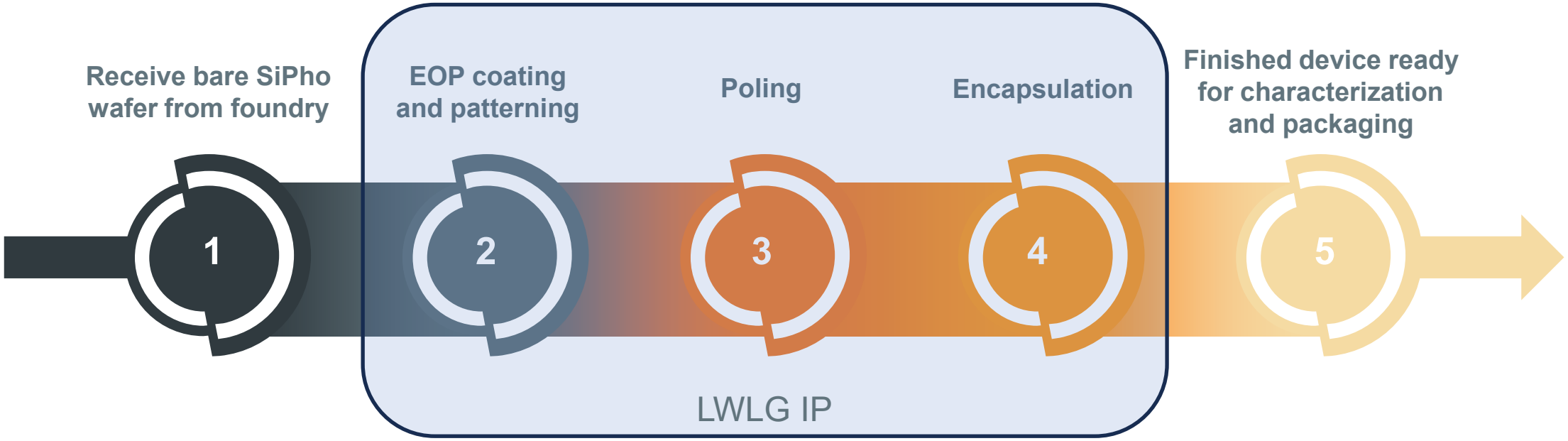
Fully compatible and integrable with SiPho foundry process

LWLG Backend/Encapsulation Process:

Currently performed in-house; fully documented and ready for transfer to the foundry



Understanding Reliability Challenges

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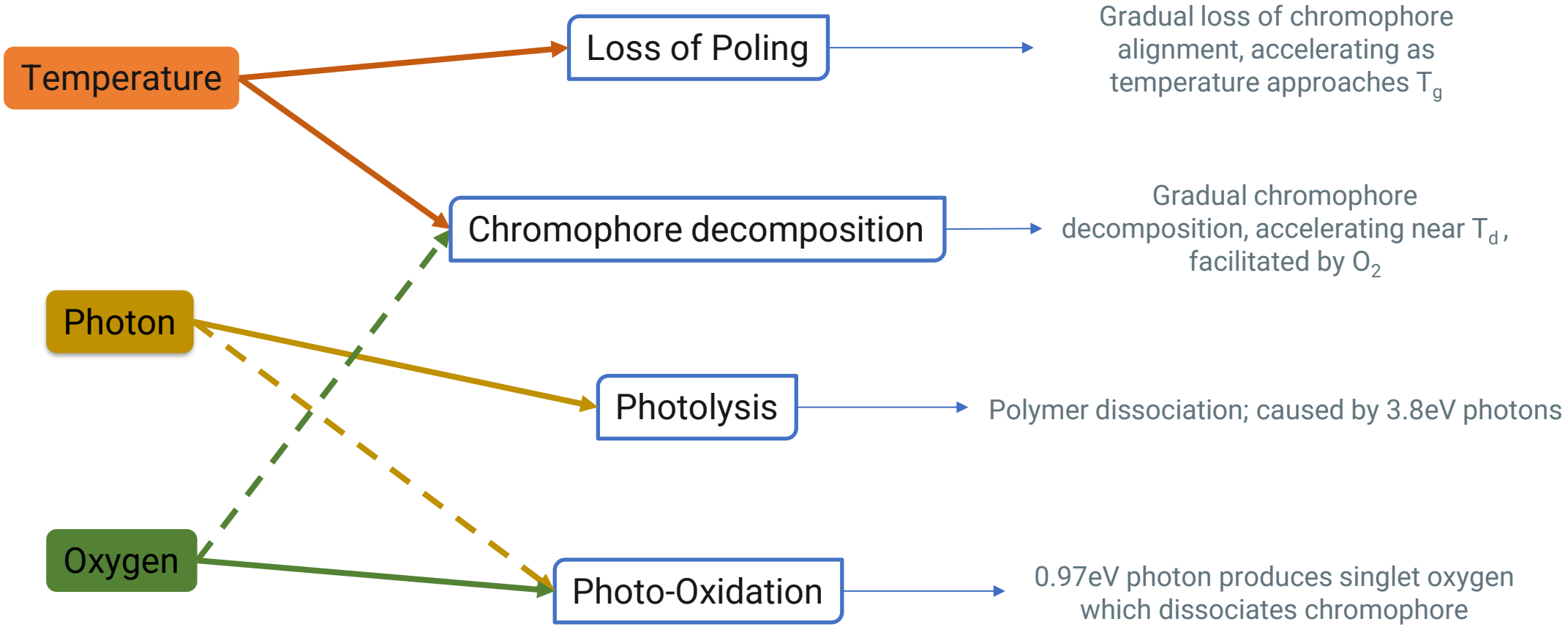

Oxygen is the primary stressor

Perkinamine® Reliability Breakthrough

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Successful passing of Telcordia GR-468 85/85 environmental stress test validates long-term reliability

1. **Sample Selection**
   - Thin-film devices with second-generation proprietary encapsulation barrier
2. **Stress Conditions**
   - 85 °C and 85 % relative humidity for 1,000 hours
     - **Industry standard rigorous conditions**
3. **Performance**
   - Change in absorbance measurements showed **only 1.6% average loss** after 1,000 hours
4. **Pass Rate**
   - More than 11 samples **exceeded Telcordia GR-468 requirements** by a wide margin

- ✓ *Confirmation that our EO polymer materials can **maintain performance** over time in harsh operating conditions*
- ✓ *Similarities with the **trajectory of Organic LEDs** before deployment in real-world applications*
- ✓ *Robust **protection against moisture and oxygen***
- ✓ *Significant breakthrough with **fourth-generation atomic layer deposition** (ALD) encapsulation material*

Proof of reliability is critical to convince customers to proceed in design win cycle

Reliability Data Summary

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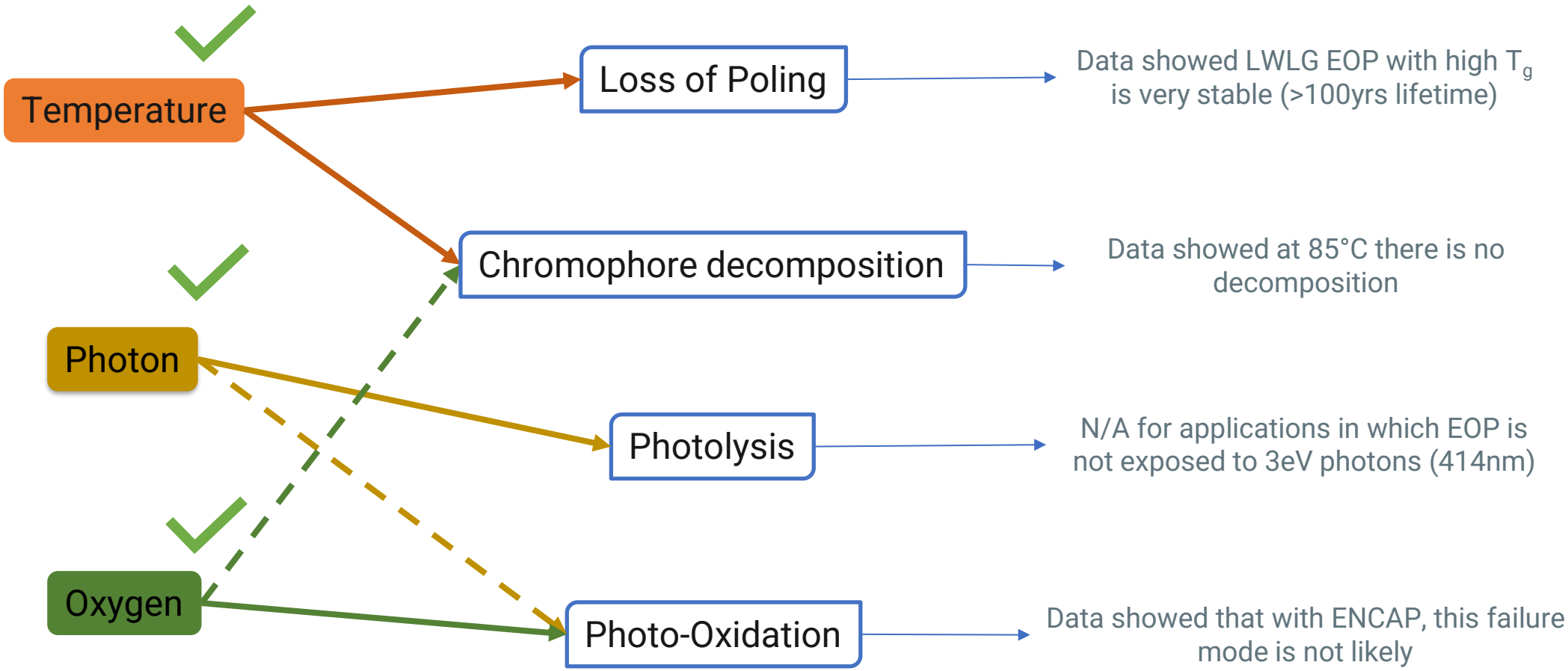

All Key Reliability Challenges Addressed

Backend Process: Introduction

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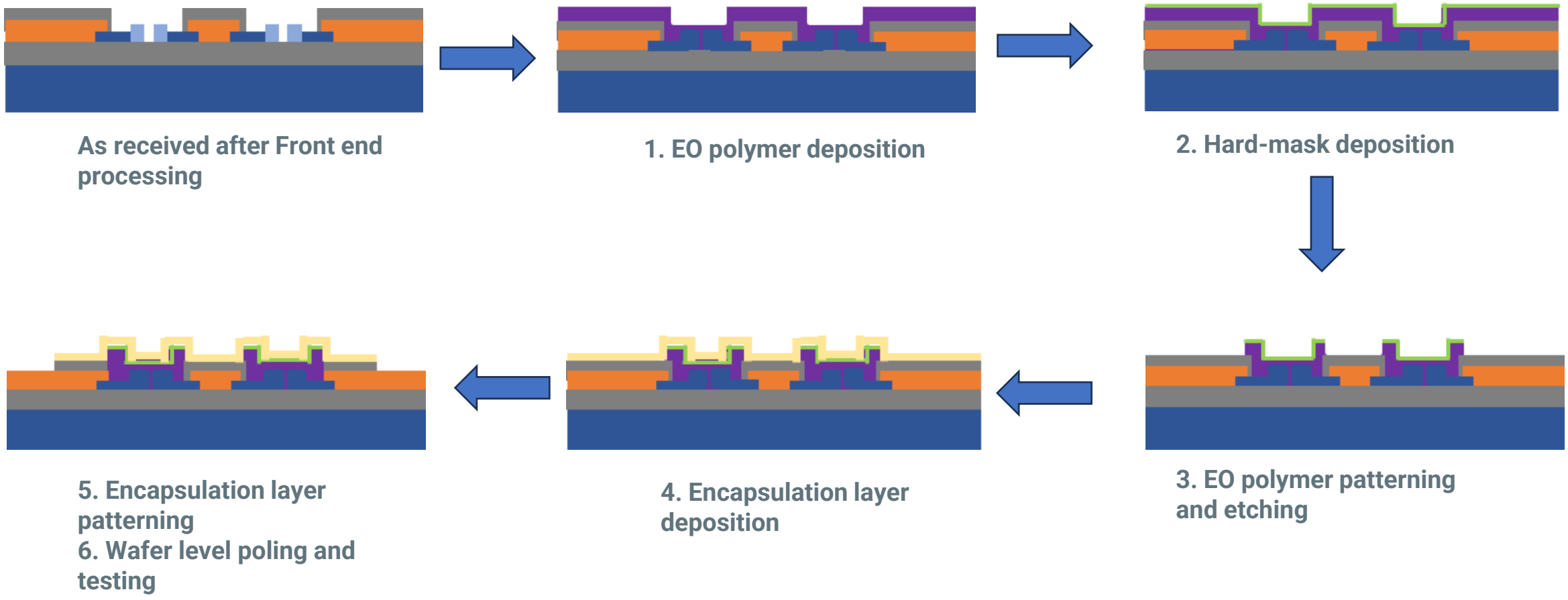
- The backend PDK is developed for applying EO polymers on the modulator device fabricated by a standard silicon photonics process (not foundry-specific)
- Key PDK steps
  - EO Polymer Deposition
  - EO Polymer Patterning and Etching
  - Encapsulation
  - Contact Pad Opening
- Wafer Level Poling and Test
- The manufacturing process is compatible with semiconductor fabrication lines using standard high-volume tools

Simplified Backend Process Overview



Example Device SEMs after EO Polymer Integration

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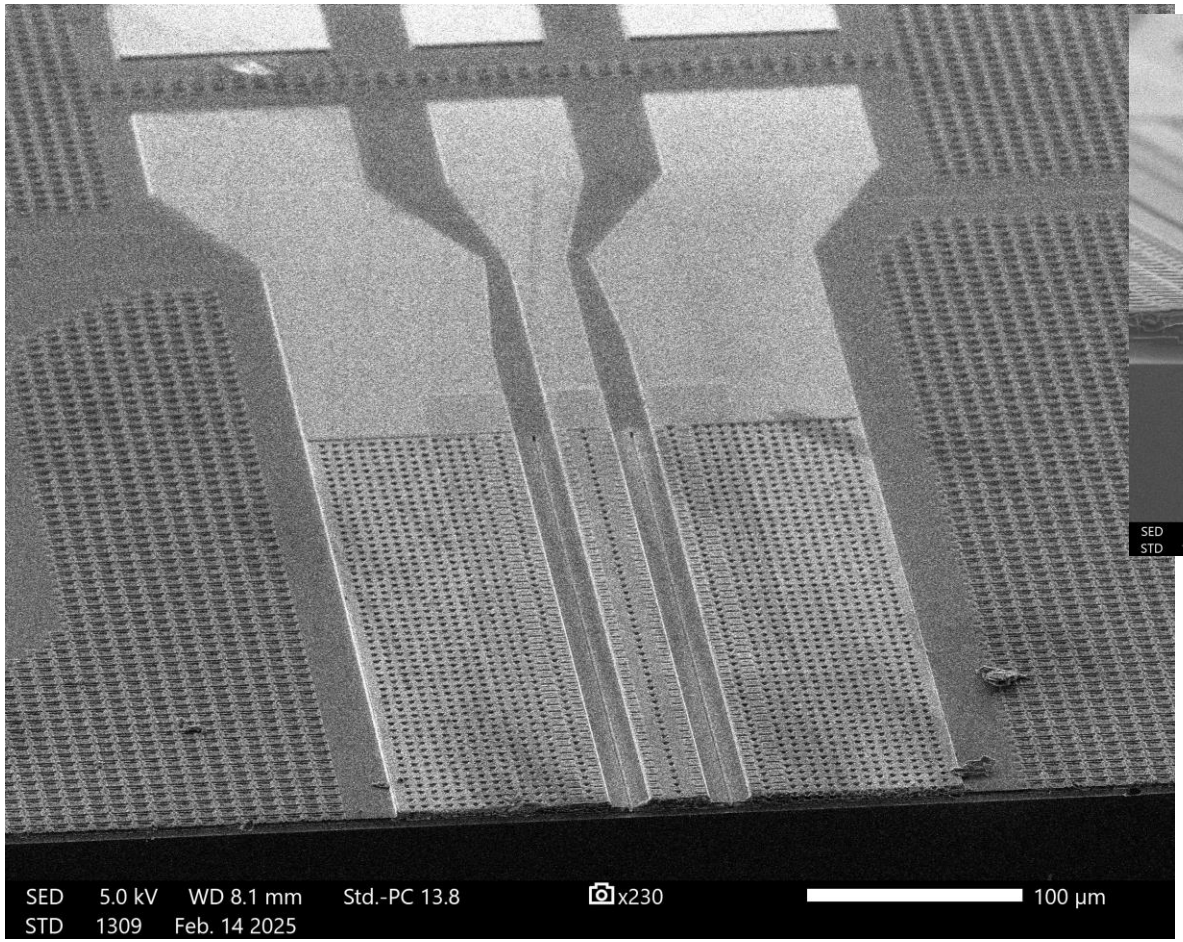

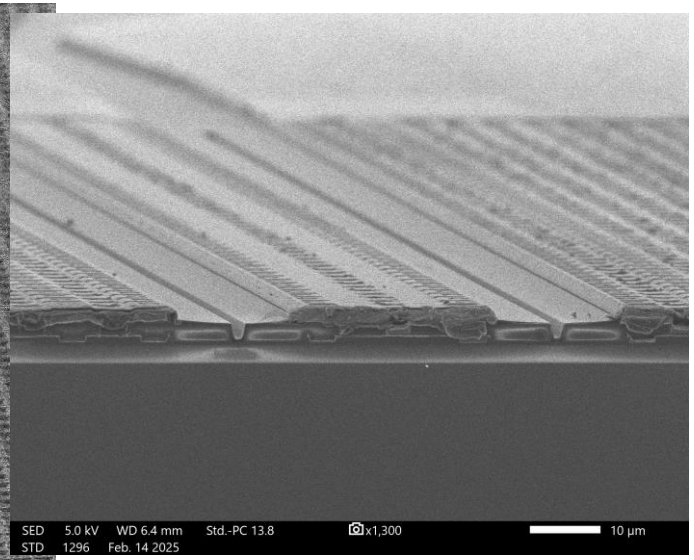

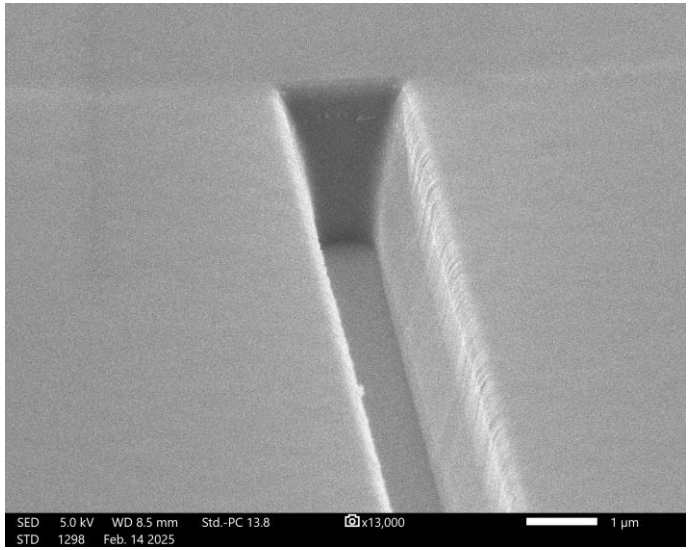

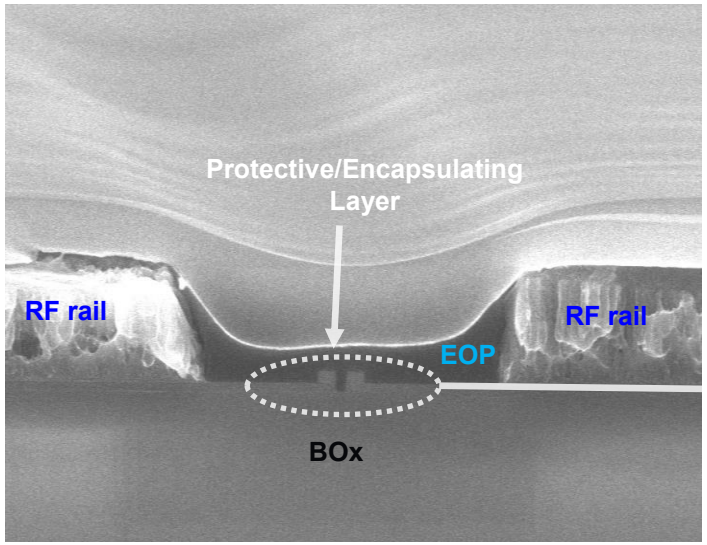

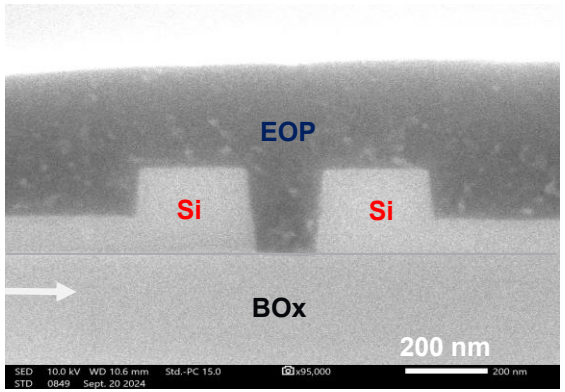

Key Takeaways

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Strong platform + favorable market dynamics to enable utilization of electro-optic polymers for high speed, low power AI and data center applications.

Unprecedented Accelerating Demand

- TAM of $24B and SAM of $1-2.5B by 2028 are growing quickly
- Driven by CapEx to address AI, quantum, datacomm & space comm requirements

Innovative EO Polymer Technology

- Disruptive technology enabler for future speed upgrades in data bandwidth
- Relieves key bottlenecks in AI infrastructure

Strong Patent Portfolio

- Protected by broad IP portfolio with over 70 patents
- Numerous patents pending

Deeply Experienced Leadership

- Management, Board of Directors, Advisory Board have 200+ years conceiving and launching products

Robust Balance Sheet

- Critical for execution
- $35M cash position provides significant optionality and execution runway *(as of 9/30/25)*

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