LIGHTWAVELOGIC®

INVESTOR PRESENTATION · August 2026

Lightwave Logic, Inc.

NASDAQ:LWLG

Enabling the utilization of electro-optics polymers for high speed, low power AI and Data Center applications

Forward Looking Statements

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.

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

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Unlocking the Power of Silicon Photonics with Electro-Optic Polymers

Perkinamine®

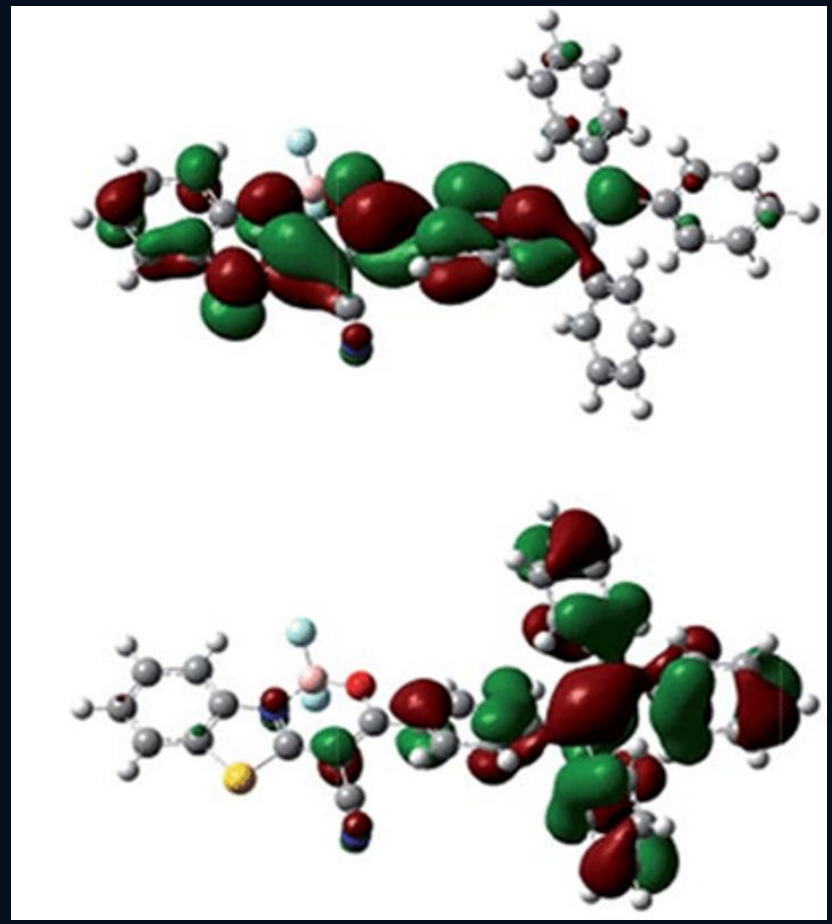
The Fastest Way to Convert Electrical Signals to Optical Signals

AI infrastructure **depends on high-bandwidth optical connectivity**

Silicon photonics enables optical connections at CMOS scale, **but performance is limited**

Lightwave Logic's **Perkinamine® electro-optic polymers unlock the bandwidth, size, and power efficiency limitations** of silicon photonics

Perkinamine® enables the **highest performing photonic integrated circuits for AI**



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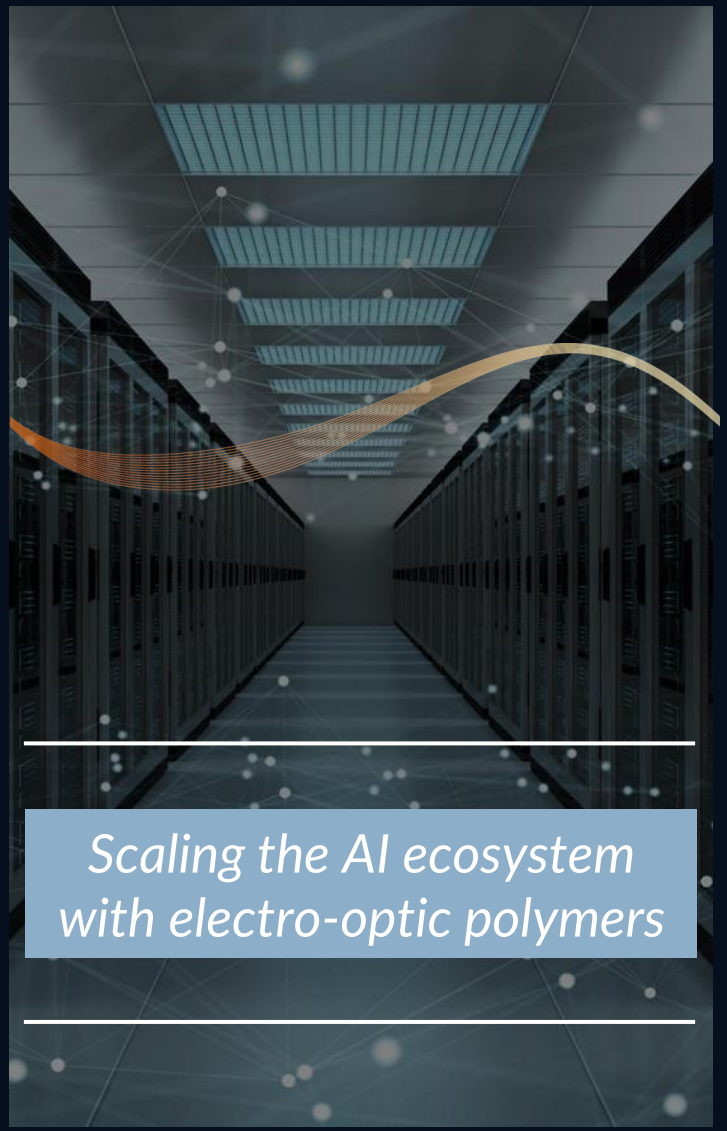
Investment Highlights

1. **Large and Attractive End Markets** – Data Center/AI capacity growth supercycle and Telecom present $54B modulator TAM, $2-4B SAM; future opportunities include Aerospace & Defense, Quantum Computing and Consumer Electronics
2. **Mission Critical Technology to AI scaling** – Existing internet infrastructure reaching its limits as ultra-high bandwidths (200G per lane and beyond) strain copper-based solutions; electro-optic polymers (EOP) can supercharge silicon photonics and alleviate bottlenecks for scaling AI clusters
3. **Competitively Advantaged Material** – Perkinamine® is compatible and easily integrated with existing silicon infrastructure; power consumption, thermal stability, speed, coating thickness, and cost all compare favorably to incumbent and competing materials
4. **Semiconductors Going Optical** – Optics now front and center in AI networking as cluster scale drives new demands on bandwidth, latency, and efficiency; optical technologies pulled into design cycle sooner
5. **Commercial Momentum** – Five Fortune (Global) 500 companies actively engaged in prototype testing with ~20 total companies in commercial pipeline; foundry ecosystem is expanding with PDKs available with Tower Semiconductor, GlobalFoundries, SilTerra, and one unnamed partner
6. **Attractive Business Model at Scale** – Dual revenue model of direct materials sales and IP licensing stream expected to yield 60%+ gross margins at scale; limited capital investment required to achieve meaningful volume production
7. **Strong Balance Sheet** - $96 million cash balance as of June 2026 and zero debt; fully funded operations well into 2028
8. **Proven Leadership Team** – Highly experienced management team with proven track records of scaling optical technologies at the largest silicon photonics and optical transceiver companies in the world



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Lightwave Logic At a Glance

Leveraging proprietary electro-optic polymers to enable high-speed optical modulators for AI scaling and data communications

Englewood, CO Global HQ	**LWLG** NASDAQ Listed	**~50** Employees[1]	**67** Granted Patents	**>$100M** R&D Investment	**$96** Cash Balance[2]

Proven Technology

- >$100M cumulative investment in technology platform since inception
- 2,000+ hours of damp heat stress testing in AI data center heat/humidity conditions show thermal stability, high performance and exceed industry standards
- Polymer, processes and designs are ready for 400Gb/s device developments

Fully Domestic Supply-Chain

- Specialty chemical precursor suppliers are all U.S.-based
- Proprietary EOP materials are synthesized and processed in Colorado
- 100% U.S.-based operations and labor
- Supply-chain is 100% free of rare Earth elements

Robust Patent Portfolio

- 67 granted patents, 80+ pending across U.S. and international markets
- Issued patents cover all stages of operations from molecular structure of polymers to device designs, fabrication, and packaging (encapsulation)
- Essential IP protection to develop licensing revenue model

(1) As of August 8, 2026
(2) As of June 30, 2026, includes Marketable Securities

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Addressable Markets in Long-Term Secular Growth

AI	Data Center (non-AI)	Telecom/Scale Across
$37 billion TAM	**$10 billion TAM**	**$7 billion TAM**
45M units of 1.6Tb/s and 3.2Tb/s transceivers/CPO (200Gb/s+ lane)	*16M units of high-speed transceivers (200Gb/s+ per lane)*	*3.5M units of coherent/DWDM transceivers (>800Gb/s per transceiver[1])*
= 230M modulators	***= 128M modulators***	***= 5M modulators***

Future Opportunities

Quantum Computing

Aerospace & Defense

Consumer Electronics

$2 – $4 billion SAM (2028)

Serviceable optical transceiver market for EOP/SOH (silicon-organic hybrid) modulators depending on integration level

Source: Lightcounting 2028 forecast for Ethernet transceivers; April 2026
(1) Due to complex encoding schemes Gb/s/lane not applicable

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AI Infrastructure is Hitting Physical Limits to Scale

AI Clusters Are Scaling Faster Than Infrastructure Can Support

Global Data Center Electricity Demand Expected to Grow 200%

(2023-2035)

The Copper Wall is Emerging

Copper interconnects cannot efficiently scale to next-gen AI speeds (800G to 1.6T and beyond)

Power

Power Density us Reaching Critical Limits

- AI racks require exponentially more power
- Heat dissipation with rack is becoming a bottleneck
- Data center power availability constrains scaling

Power Usage and **Heat** limit rack density, total compute, and scalability

Connectivity / Bandwidth

Data Movement is Becoming the Bottleneck

- Higher AI speeds require bandwidth increases
- Copper interconnects degrade at 400G and beyond
- Signal loss, latency and retries increase with scale

Latency and **Low Bandwidth** limit cluster performance and networking

Integration / Architecture

Systems Must Integrate Efficiently

- Demand for co-packaging and optical integration
- Increased complexity in system designs
- Traditional architectures no longer scale efficiently

Integration complexity is slowing network scalability

(1) IEA (2025) World Energy Outlook Special Report, "Energy and AI."

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Silicon Photonics & the Perkinamine® Advantage

Perkinamine® doesn't replace silicon photonics — it completes it

What is Silicon Photonics?

Silicon photonics transmits data using light instead of electrical current, encoding information onto laser beams guided through microscopic waveguides etched onto silicon chips. Built on standard semiconductor foundry processes, it enables high-speed, low-power optical links at scale.

Overcoming the bandwidth bottleneck

Every silicon photonic system needs a modulator to convert electrical signals into encoded light. Conventional silicon modulators hit a hard ceiling at 50 - 67 GHz, too slow for today's AI interconnect demands.

Lightwave Logic's Perkinamine® polymer replaces the modulation mechanism entirely, pushing bandwidth well past 100 GHz.

100+ GHz

BANDWIDTH

Breaks the 50–67 GHz silicon ceiling, ready for 200G and beyond.

< 1 V

DRIVE VOLTAGE

Far lower power per bit vs. silicon or lithium niobate modulators

Zero

BIAS DRIFT

No active stabilization circuitry, enabling simpler system design.

CMOS

FOUNDRY COMPATIBLE

Standard silicon photonics Process Design Kits (PDKs) at Tower, GlobalFoundries & SilTerra

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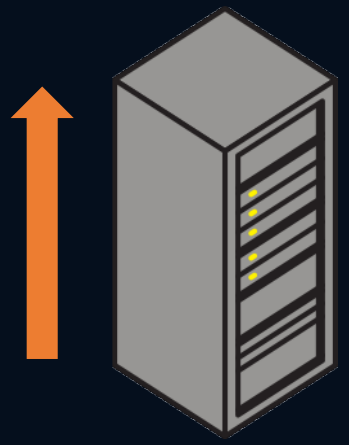
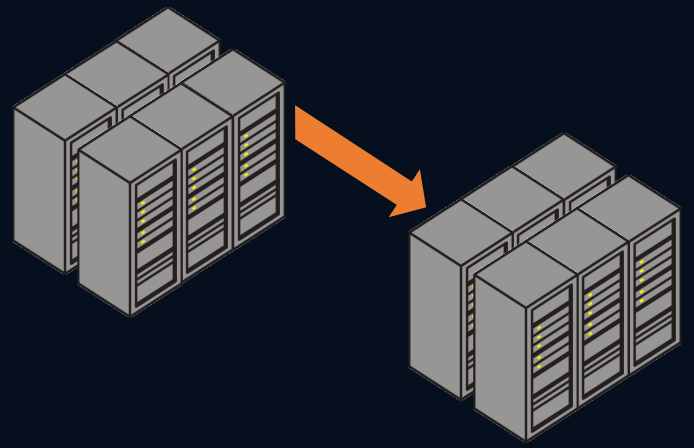
AI Cluster Opportunity (Scale X)

Scale Up
Within the Rack



Scale Out
Across Racks

Scale Across
Between Data Centers



EO Polymer Advantage

Increase bandwidth shoreline density and power efficiency for co-packaged optics

Reduce I/O power and enable high-density rack-to-rack AI fabrics

Deliver ultra-high-speed optical bandwidth for distributed, multi-site AI infrastructure

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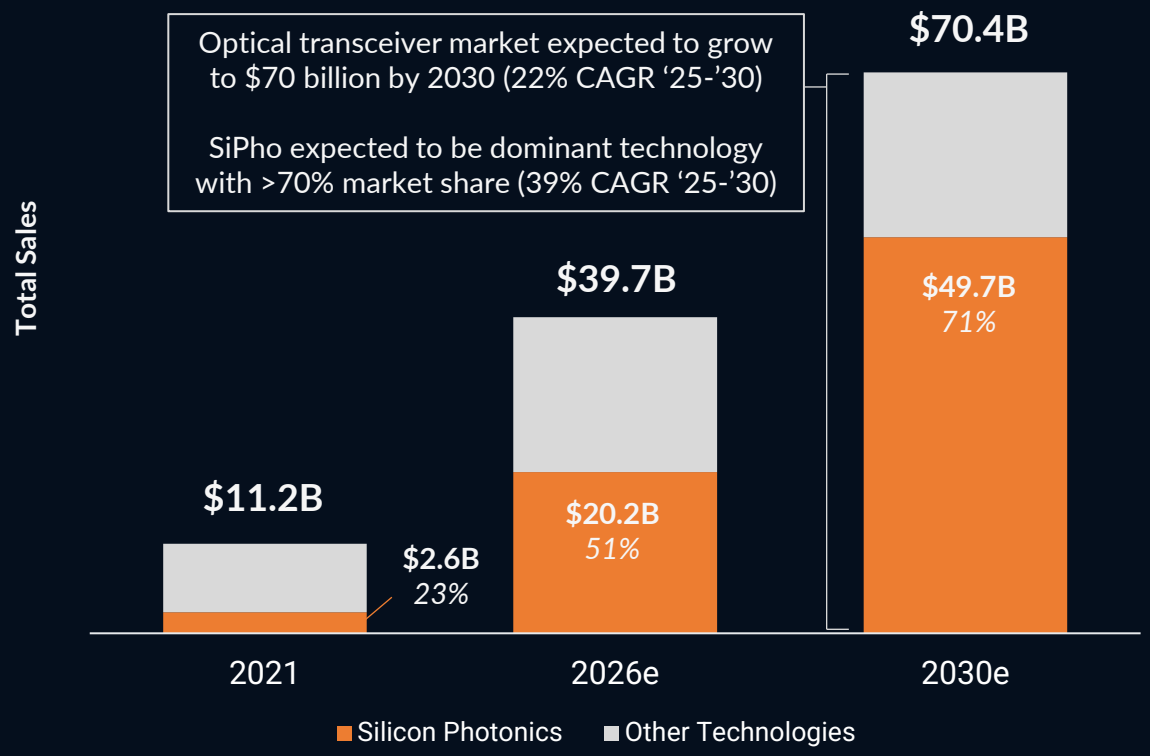
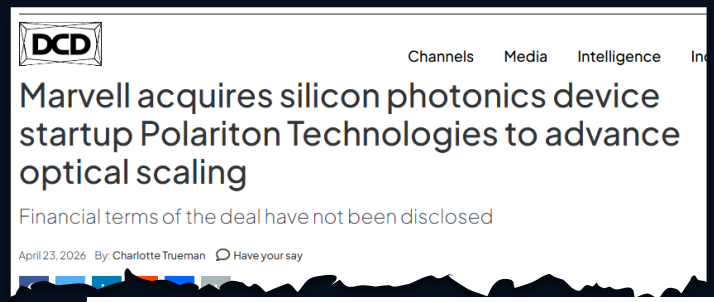
Silicon Photonics is Winning

Silicon photonics is winning the integration platform battle for hyperscale and AI networking

Total Optical Transceiver Market[1]

(by technology)




DCD

Channels Media Intelligence

Marvell acquires silicon photonics device startup Polariton Technologies to advance optical scaling

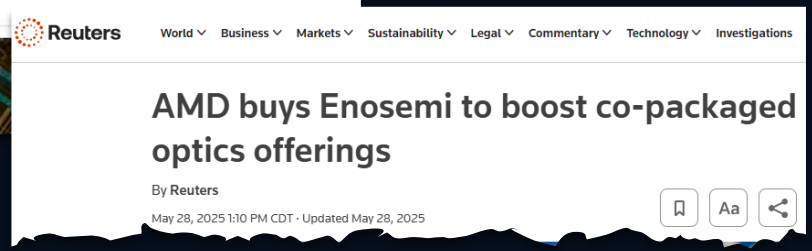
Financial terms of the deal have not been disclosed

April 23, 2026 By: Charlotte Trueman Have your say

GlobalFoundries Acquires Advanced Micro Foundry, Accelerating Silicon Photonics Global Leadership and Expanding AI Infrastructure Portfolio

Samsung enters SiPh foundry market

Tuesday 31st March 2026


Reuters

World Business Markets Sustainability Legal Commentary Technology Investigations

AMD buys Enosemi to boost co-packaged optics offerings

By Reuters

May 28, 2025 1:10 PM CDT · Updated May 28, 2025

Marvell to acquire Celestial AI for as much as $5.5 billion

PUBLISHED TUE, DEC 2 2025·5:12 PM EST | UPDATED TUE, DEC 2 2025·6:40 PM EST

Kif Leswing @KIFLESWIN

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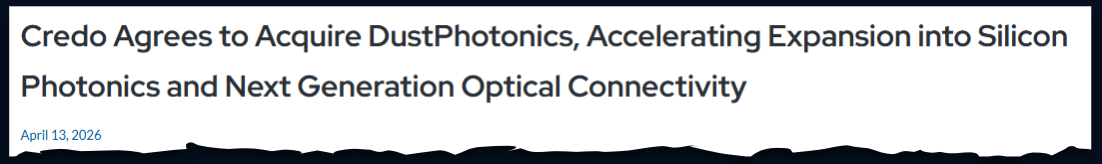
Credo Agrees to Acquire DustPhotonics, Accelerating Expansion into Silicon Photonics and Next Generation Optical Connectivity

April 13, 2026

(1) Lightcounting: Total Optical Transceiver Market by Technology; April 2026
News sources: CNBC, Data Center Dynamics, Credo, GlobalFoundries, PIC Magazine, Reuters

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Competitively Advantaged Material

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

LIGHTWAVELOGIC®

	Silicon Photonics (SiPh)		Thin Film Lithium Niobate (TFLN)	Silicon Organic Hybrids (SiPh + EOP)
Modulator Type	Ring	Mach-Zehnder (MZ)	MZ	MZ or Ring
Speed	🟡	🟡	🟢	🟢
Power Consumption	🟢	🟠	🟠	🟢
Size	🟢	🟡	🔴	🟢
Cost	🟢	🟢	🔴	🟢
Novel material	🟢	🟢	🟠	🟠
Integration (Si & CMOS Compatible)	🟢	🟢	🟠	🟢

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Reliability Performance Exceeds Industry Standard

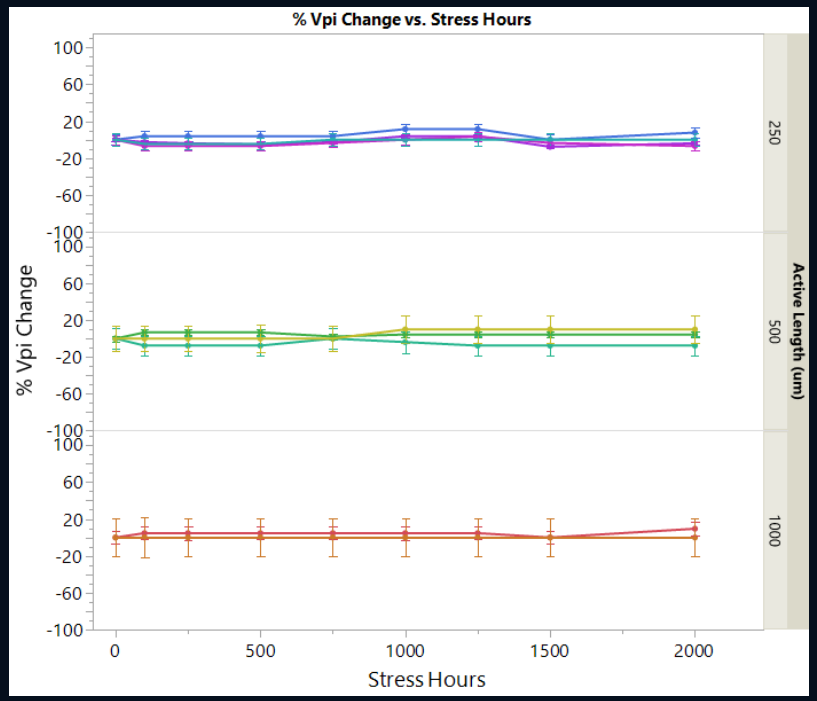
Material Reliability Challenges Addressed

Loss of Poling	Data demonstrates LWLG EO polymer is very stable at high temperatures (>>100yr projected lifetime at 85°C)
Chromophore Decomposition	Data showed no decomposition in harsh environments (e.g., 85°C/85% r.h.)
Photolysis	N/A for applications in which EO polymers is not exposed to 3.8eV photons (326nm or lower)
Photo-Oxidation	Data showed this failure mode is not likely with proprietary encapsulation

2025 Milestone: Validated that latest generation LWLG EO polymers pass Telcordia stress tests when used with proprietary encapsulation

Device Reliability In Progress

Temperature = 85 °C | Humidity = 85%rh



Ongoing chip and device level reliability tests to validate reliability for foundry specific processes and device level encapsulation

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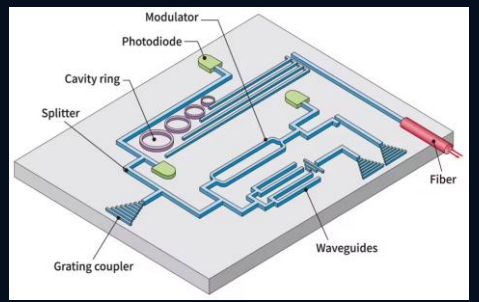
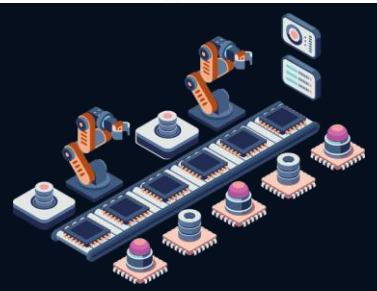
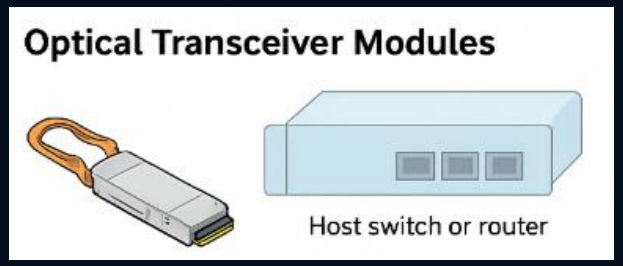
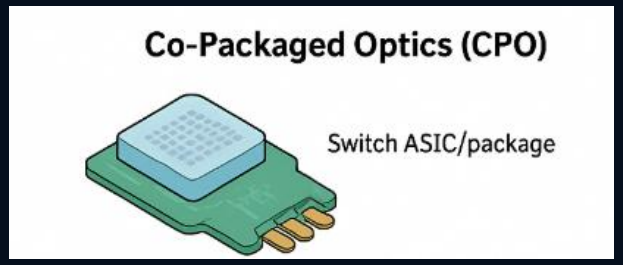
The Product Design Process









1 **Perkinamine EO Polymer**

2 **Silicon Photonics PIC (Photonics Integrated Circuit)**

3 **Integrated Optical Module**

4 **Datacenter or AI Factory**

Representative Companies:

LIGHTWAVELOGIC®

Tower Semiconductor, intel, MARVELL, SILTERRA, tsmc, GlobalFoundries, Google, NVIDIA

COHERENT, LUMENTUM, INNOLIGHT, BROADCOM, NVIDIA

Google, aws, NVIDIA, Microsoft, Meta

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Path to Commercialization & How We Scale

Two Go-to-Market Channels

1 Chip Designers / Module Companies

Design and build optical transceivers and networking hardware

- Integrate LWLG EO polymer materials into product designs
- Drive performance, size, power and cost advantages

2 Foundry Partners

Manufacture silicon photonics for a broad ecosystem

- Integrate LWLG IP / PDK into process flows
- Enable high-performance silicon photonics at scale

Tailored Engagement

Engagement with Chip Designers

Material Evaluation
Performance testing & validation

Co-design & integration
Work with design teams to optimize performance

Design win progression
From prototype to qualified design

Engagement with Foundry Partners

PDK Integration
Integrate LWLG IP/PDK into design kits

Process enablement
Enable & optimize in manufacturing flows

Platform qualification
Complete foundry & ecosystem qualification

Iterative Processes

- **Qualification** ~20 Programs in Process
- **Design Wins** 5 Programs in Process
- **Production**
- **Volume Ramp**

- **PDK Qualification** 4 Foundry Partners
- **Production**
- **Volume Ramp**

Commercial Revenue Model

1 Material Sales Revenue

- EO polymer materials supplied for production
- Revenue scaled with production volume

2 Licensing Revenue

- Enables silicon photonics manufacturing
- IP / PDK licensing and royalties from foundries and / or end customers
- Revenue scales as customer programs move to production

Scalable, Asset-Light Model

- **Embedded in customer production flows**
- **Leverages existing customer infrastructure**
- **Expands across multiple customers & platforms**
- **Attractive gross margin profile at scale (60%+)**

Path to Scaled Revenue

Today
Non-Recurring Engineering Fees
Pre-production revenue

2H 2027+
Begin Volume Production + Licensing Revenue
Long-term, scalable revenue streams

Dual strategy with multiple touchpoints and complementary economics. One platform delivering sustainable, high-margin growth.

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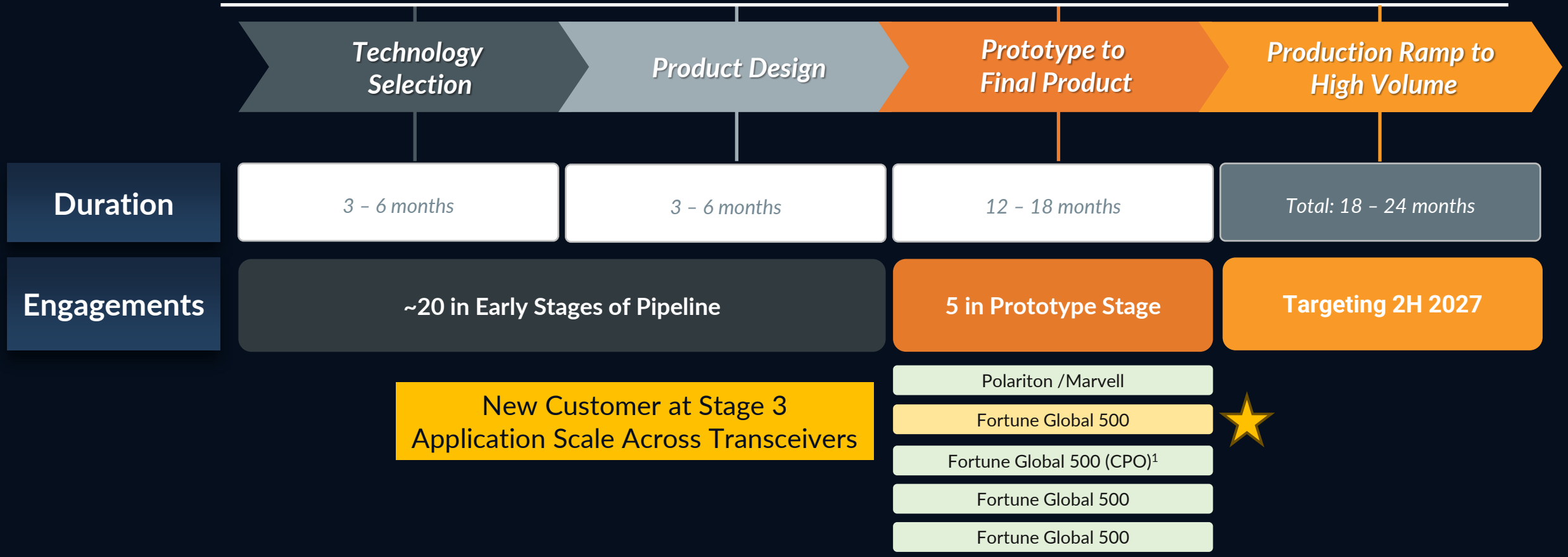
Market Reception & Customer Momentum Growing

Now Five customers in Prototype Stage 3



(1) Formal product launch decision is contingent upon the successful execution of technical milestones related to Perkinamine® performance as well as achieving various other modulator design and integration results

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Foundry Ecosystem is Broadening

Foundries are key enablers to integration and scaled production as well as IP licensing strategy

4 Foundry PDK Integrations

Tower Semiconductor

GlobalFoundries™ GDS FACTORY

SILTERRA LUCEDA PHOTONICS

+ One unnamed partner

Lightwave Logic and Tower Semiconductor Announce Development Agreement to Enable High-Speed, Low-Power Modulators on Tower's PH18 Silicon Photonics Platform

Lightwave Logic High-Speed Modulator Platform Now Available in GDS Factory PDK for GlobalFoundries Silicon Photonics Platform

SilTerra Silicon Photonics Platform Enables Integration of Lightwave Logic High-Speed Polymer Modulators Through Luceda Photonics PDK

March 3, 2026

Polymer platform integrated in foundry ecosystem; processes and designs are ready for 400Gb/s device deployments

Four wafer tape outs planned throughout 2026

Multiple wafers Expected from Two Foundries in August 2026

Additional Projects

QPICS

Lightwave Logic, Inc. and QPICs Announce Partnership to Advance the Use of Electro-Optic Polymers in Quantum Processors

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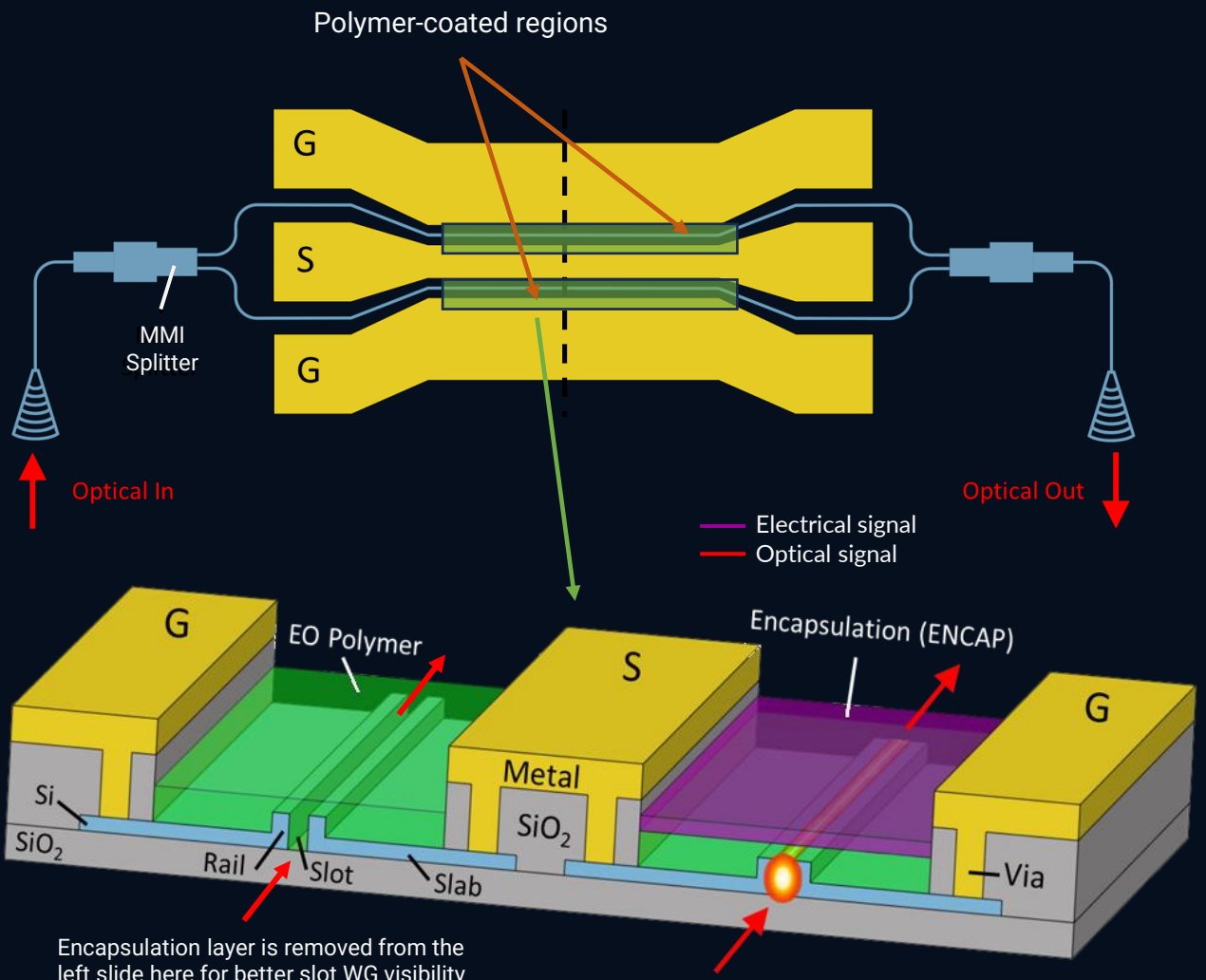
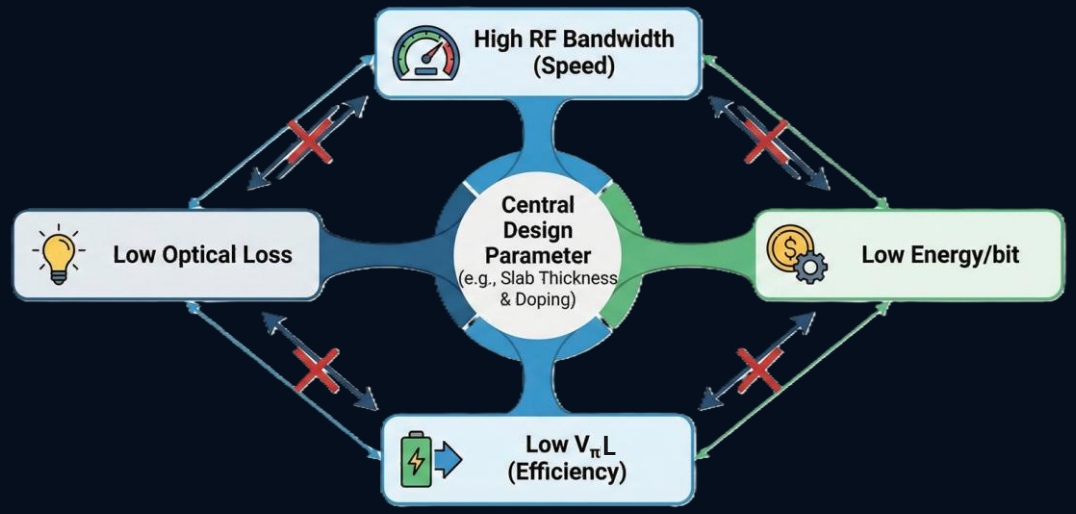
EO Polymer SOH MZI Slot Modulator Structure



Source: J.A. Drisko et.al. Frontiers in Optics, pp. FM1C-1.Optica Publishing Group (2024)



The SOH (Silicon-Organic Hybrid) Advantage:

- Combines the **maturity** of Silicon Photonics with the **strong EO response** of polymers
- Offers significant promise for scalable deployment in the **datacom and telecom spectrum** (O- and C-bands)
- Core technology is **CMOS compatible** and **mass-scalable**

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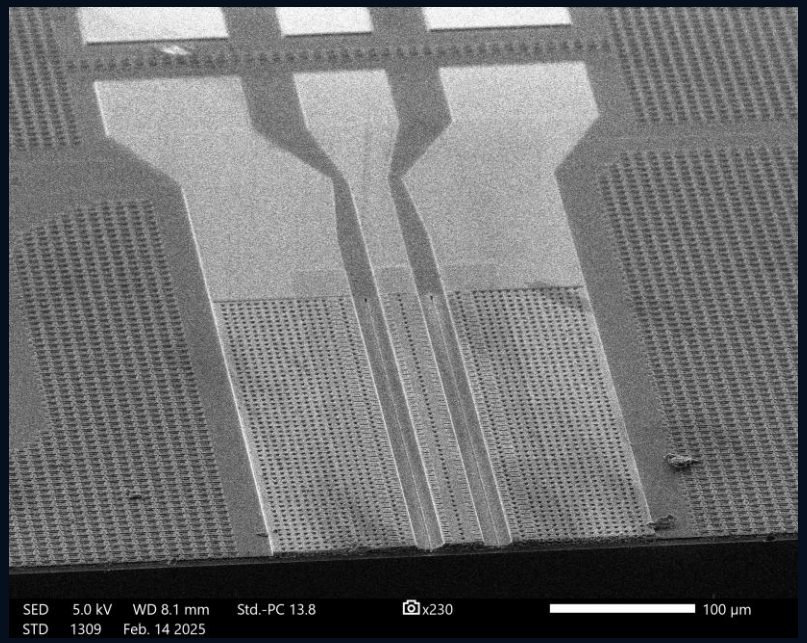
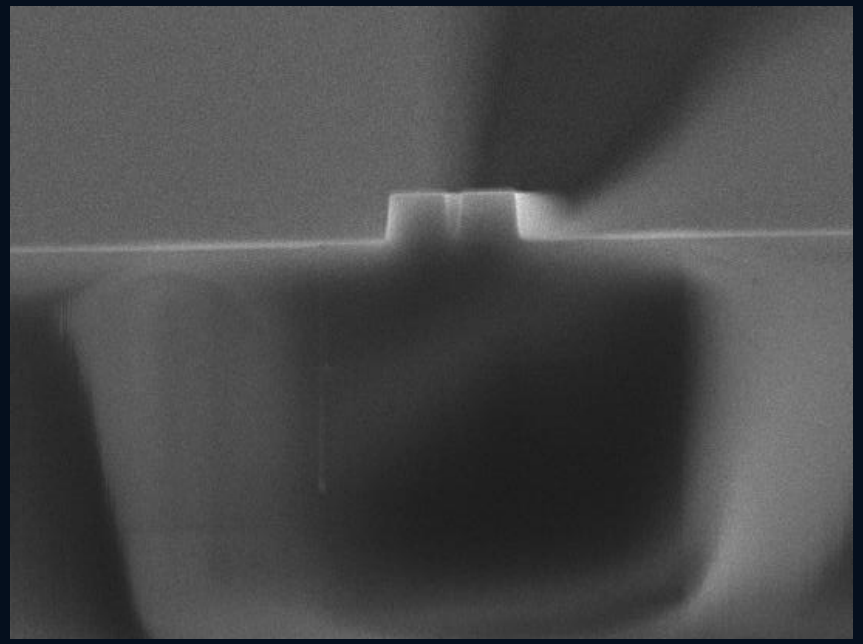
Silicon Slot Waveguide Cross Sections

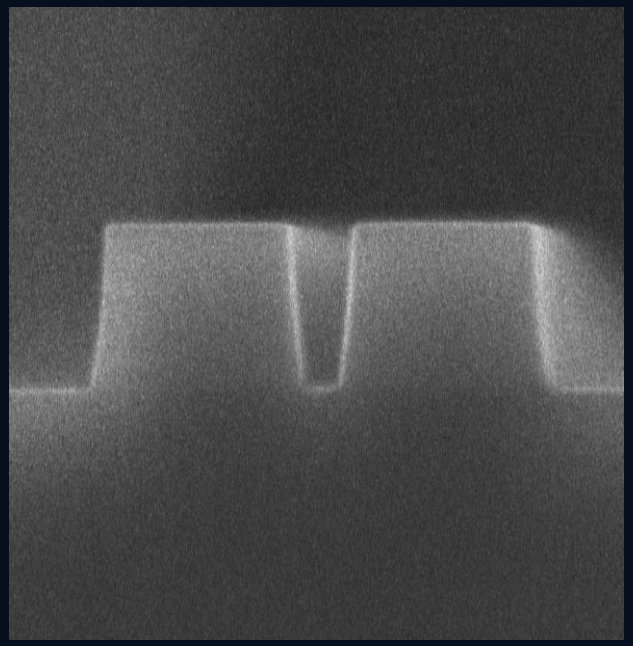
Collaborating with foundries to produce consistent slot waveguides for optimal performance



100 µm



500 nm



100 nm

Clean, sharp and smooth Si slots for polymer deposition and encapsulation

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Strong Patent Portfolio

Materials	Patent protection on **new, innovative EO chromophores and molecular architectures** to meet application needs such as high electro-optic activity and stability
Optical Devices	Patented **device designs** to engineered approaches to enhance performance and optimize controls within modulators
Fabrication	Protected **fabrication and manufacturing** methods to enhance ways for partners to work with materials and advance ease of use
Integration	Patented **integration methodologies** to add functionality to existing semiconductor devices and innovate photon exchange with minimal losses
Packaging	Important patent protection on **encapsulation and packaging** to address key challenge of maintaining the quality of RF electrical signals and hermetic sealing

67 granted; 80+ pending U.S. and international patents[1]

Patent portfolio spans major aspects of manufacturing and operations

IP protection is essential to monetization and royalty licensing strategy

(1) As of December 31, 2025

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Strong Management Team

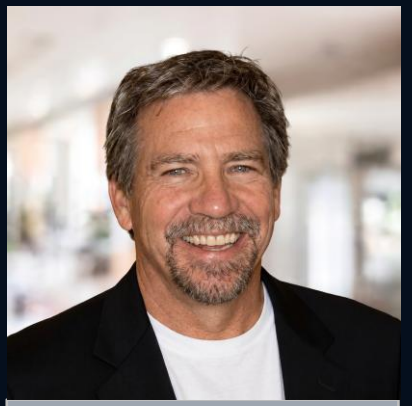
Broad Operational and Research Expertise Across Photonics Ecosystem

Yves LeMaitre
CEO & President

Fred Graffam
Chief Financial Officer

Dr. Aref Chowdhury
Chief Technology Officer & Head of Strategy

Dr. Robert Blum
SVP, Sales & Marketing



Dr. Lance Thompson
VP of Engineering

LUMENTUM
IPG PHOTONICS
OCLARO
fidium
COMCAST
DigitalGlobe
NOKIA
NOKIA Bell Labs
Alcatel·Lucent
APPLIED MATERIALS
intel
JDSU
COHERENT
LUMENTUM
SUMITOMO ELECTRIC

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2026 YTD Financials

YTD 2026

FINANCIAL RESULTS

Added two Fortune Global 500 companies to Prototype Stage 3 of Design Win Cycle in February

Announced availability of polymer technology within Luceda PDK targeting SilTerra's silicon photonics platform

Signed a development agreement with Tower Semiconductor to use our polymer technology on Tower's PH18 silicon photonics platform

Announced availability of polymer technology within GDSFactory PDK to support GlobalFoundries' silicon photonics platform

Raised $34 million through public offering of common stock through June 30, 2026

TOTAL REVENUE ($ thousands)

$62

+28% YoY

vs. $49 prior year

NET LOSS ($ millions)

$12.9

+34% YoY

vs. a loss of $9.7M prior year

NET LOSS PER SHARE ($)

$0.09

+7% YoY

vs. a loss of $0.08 prior year

R&D INVESTMENT ($ millions)

$7.4

+29% YoY

vs. $5.7M prior year

G&A EXPENSE ($ millions)

$6.7

+62% YoY

vs. $4.1M prior year

CASH, EQUIVALENTS and MARKETABLE SECURITIES ($ millions)

$96.0

+39%

vs. $69M as of 12/31/25

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Outlook and Priorities for 2026

1. Advance Stage 3 programs toward qualification milestones and Stage 4
2. Convert technical engagements into structured commercial agreements
3. Broaden and strengthen the EO polymer-ready silicon foundry ecosystem
4. Continue performance optimization at 200G, 400G per lane and beyond
5. Prepare operationally for a 2027 production ramp transition

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Critical Inflection Point

Substantial investment in technology and production capabilities now intersecting with opportune entry point for electro-optic polymers as AI scaling reaches a critical bottleneck

DURABLE DEMAND DRIVING SECULAR GROWTH

- Unprecedented capex supercycle as hyperscaler data center and AI spend now exceeding $200B per year
- Optical transceiver market expected to grow to $70B by 2030 (22% CAGR)[1]
- Next-generation platforms demand 400G and 800G optical links per lane, which silicon photonics modulators fail to meet
- TAM of $54B and SAM of $2-4B supported by long-term, durable growth drivers[2]

SEMICONDUCTORS TAKING OVER OPTICS

- Optics now front and center in AI networking as cluster scale drives new demands on bandwidth, latency, and efficiency
- AI workloads pulling optical technology into design cycles sooner, especially beyond today's 200G-per-lane era
- Silicon photonics market expected to grow at a 39% CAGR through 2030[1]
- Expected to be dominant technology with >70% market share in 2030[1]
- Winning material will be silicon compatible

OPERATIONS READY TO EFFICIENTLY SCALE

- >$100M invested in Perkinamine technology platform since inception of the Company; material is ready for 400G+ device deployments
- Stress-testing manufacturing operations for scale up of production volume; current footprint capable of handling volume ramp
- Limited incremental investment required to reach meaningful volume production
- $96 cash balance[3] and zero debt
- Perkinamine® is fully compatible with silicon infrastructure and CMOS fabrication process

(1) Lightcounting: Total Optical Transceiver Market by Technology; April 2026
(2) Lightcounting: 2028 forecast for Ethernet transceivers; April 2026
(3) As of June 30, 2026 and includes cash, cash equivalents and marketable securities

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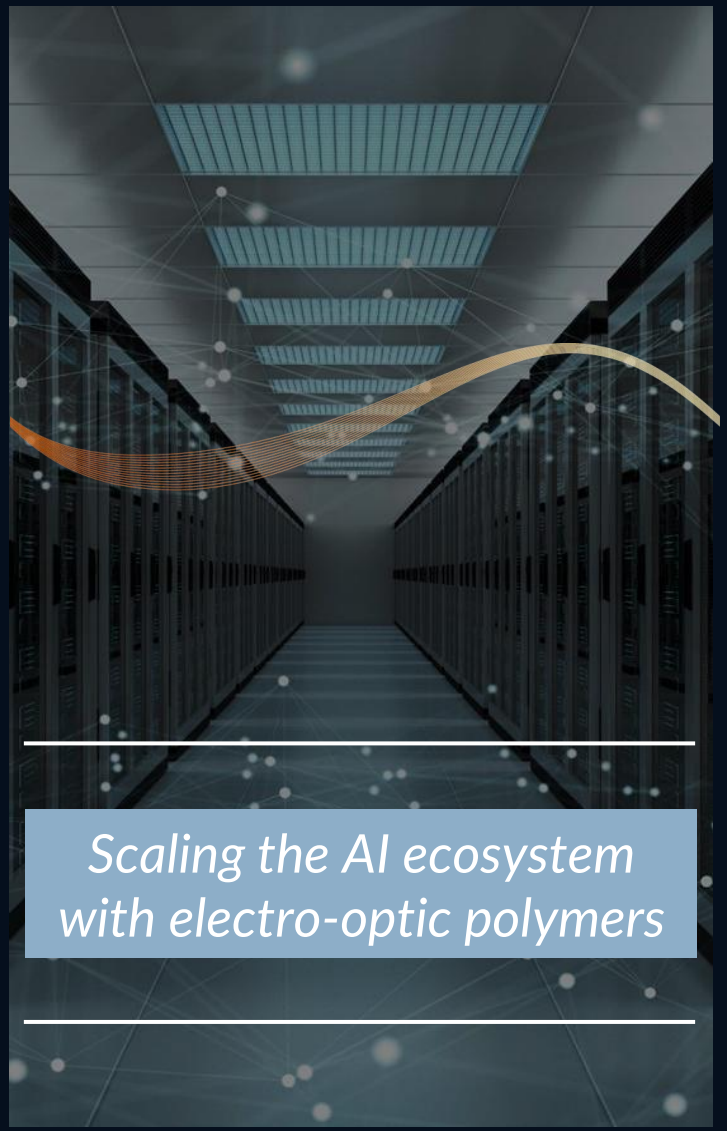
Investment Highlights

1. **Large and Attractive End Markets** – Data Center/AI capacity growth supercycle and Telecom present $54B modulator TAM, $2-4B SAM; future opportunities include Aerospace & Defense, Quantum Computing and Consumer Electronics
2. **Mission Critical Technology to AI scaling** – Existing internet infrastructure reaching its limits as ultra-high bandwidths (200G per lane and beyond) strain copper-based solutions; electro-optic polymers (EOP) can supercharge silicon photonics and alleviate bottlenecks for scaling AI clusters
3. **Competitively Advantaged Material** – Perkinamine® is compatible and easily integrated with existing silicon infrastructure; power consumption, thermal stability, speed, coating thickness, and cost all compare favorably to incumbent and competing materials
4. **Semiconductors Going Optical** – Optics now front and center in AI networking as cluster scale drives new demands on bandwidth, latency, and efficiency; optical technologies pulled into design cycle sooner
5. **Commercial Momentum** – Four Fortune (Global) 500 companies actively engaged in prototype testing with ~20 total companies in commercial pipeline; foundry ecosystem is expanding with PDKs available with Tower Semiconductor, GlobalFoundries, SilTerra, and one unnamed partner
6. **Attractive Business Model at Scale** – Dual revenue model of direct materials sales and IP licensing stream expected to yield 60%+ gross margins at scale; limited capital investment required to achieve meaningful volume production
7. **Strong Balance Sheet** - $96 million cash balance as of May 2026 and zero debt; fully funded operations well into 2028
8. **Proven Leadership Team** – Highly experienced management team with proven track records of scaling optical technologies at the largest silicon photonics and optical transceiver companies in the world



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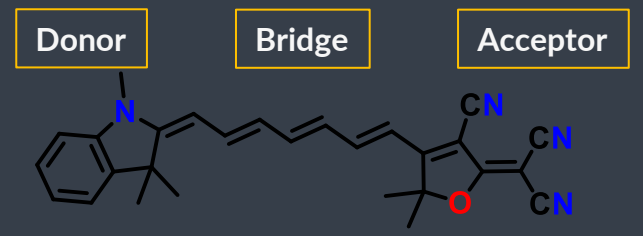
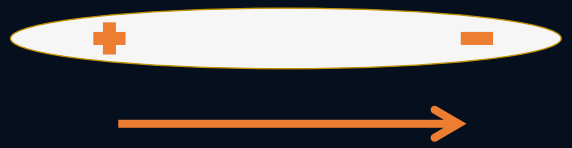
Technical Support

Electro-Optic (EO) Polymer: Mechanism of Operation

General chromophore structure



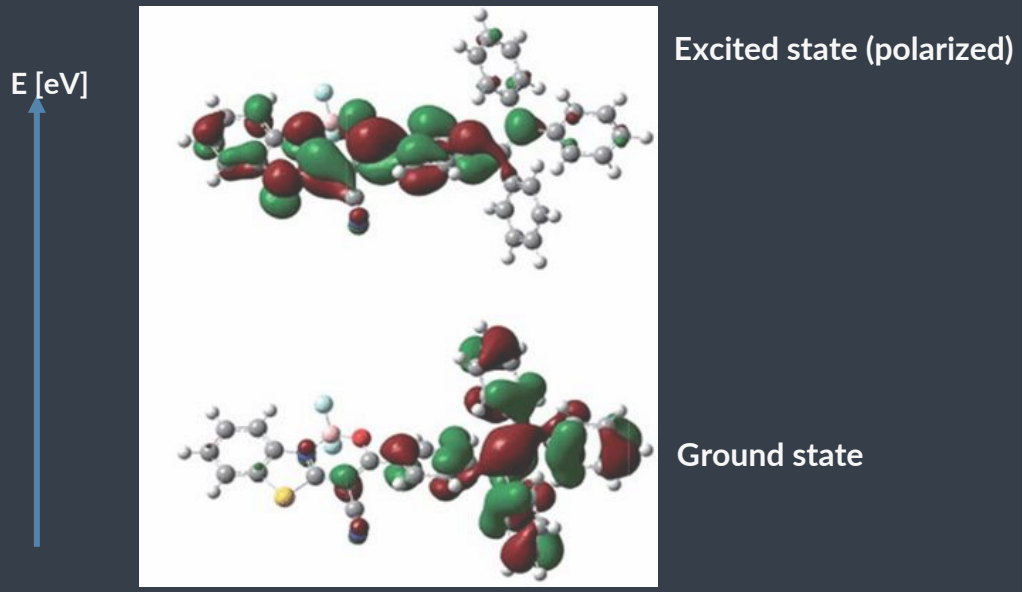
Chromophores are dipolar molecules



Chromophores are aligned in the host polymer through a poling step

Pockels Effect:

- Linear electro-optic effect with THz response frequency
- 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.

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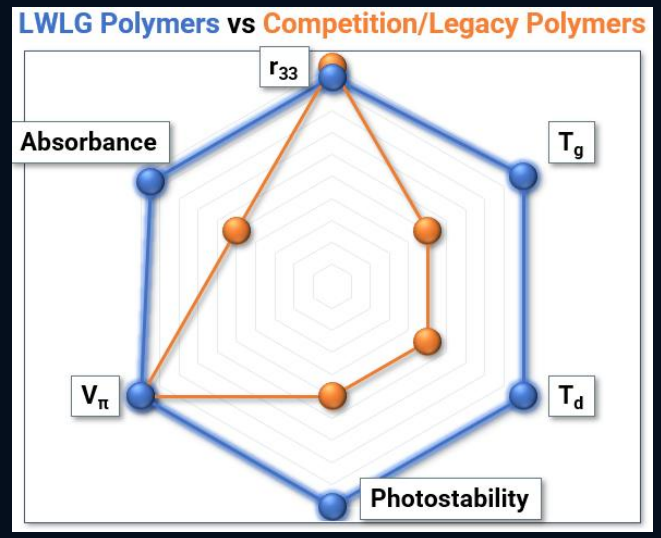
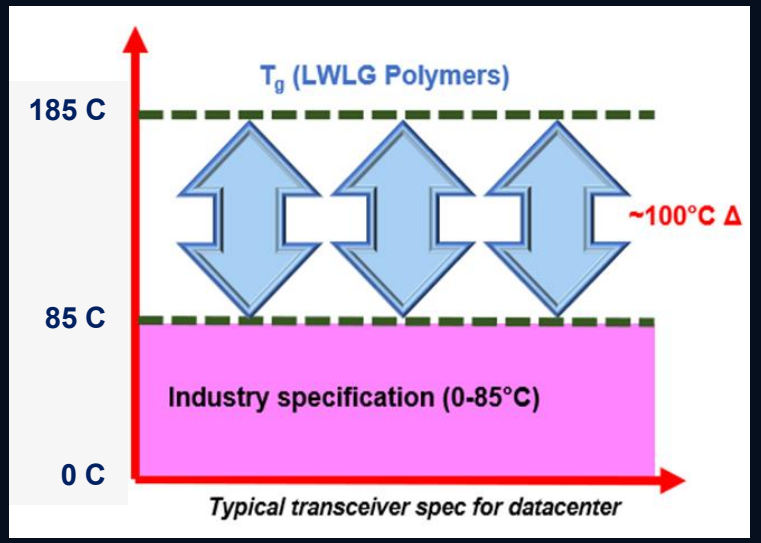
LWLG EO Polymers: Characteristics → Benefits

High electro-optic coefficient (r_{33} > 200 pm/V)	→	Low V_{pp} (low $V_\pi \cdot L$ < 1 V mm)
	→	Small, highly integratable devices (< 1mm)
Easy integration with SiPh device fabrication	→	Leverages SiPh device eco-system
	→	Low cost
Intrinsic modulation speed in the THz range	→	High BW SiPh devices possible (> 100 GHz)
Low dielectric constant	→	Optical and RF speed matched in device
High T_g	→	Post Poling Process Temps up to 185 °C Operating temperatures > 85 °C





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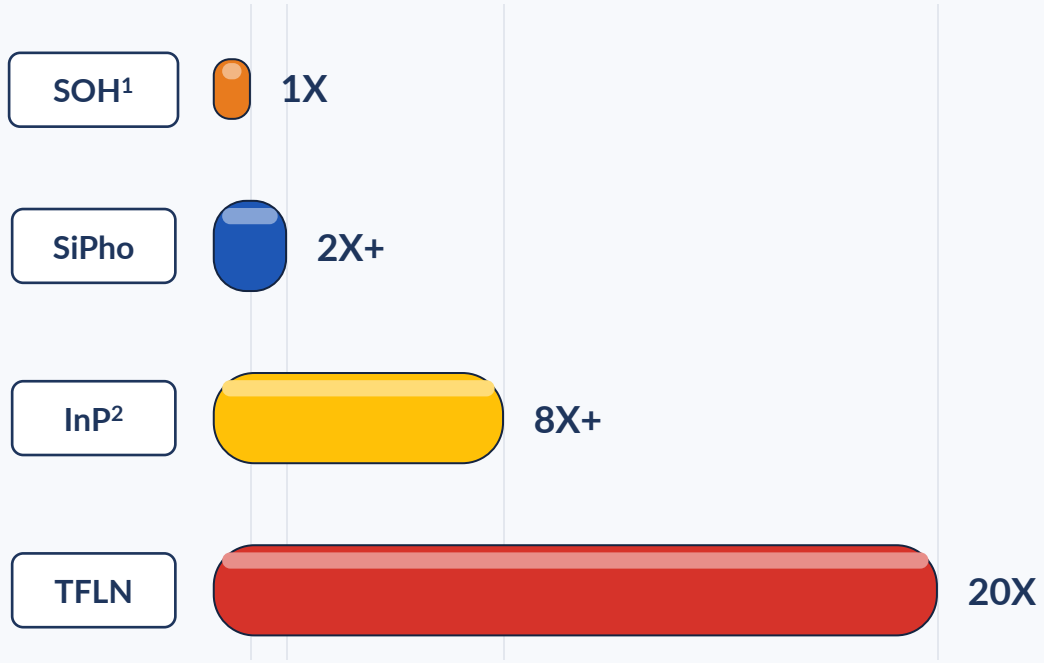
Key Modulator Technologies: Implementation Trends

Relative Size of Modulators



← *Smaller footprint enables denser integration in optical modules*

Expected Relative Cost

SOH* + CW Laser[3]	1X
SiPho + EML Laser[4]	4X+
TFLN + EML Laser	6X+
InP + EML Laser	12X+
SiPho or TFLN + CW Laser	?

(1) SiPho utilizing Perkinamine®
(2) InP = Indium phosphide
(3) CW = continuous wave
(4) EML = electro-absorption modulated laser

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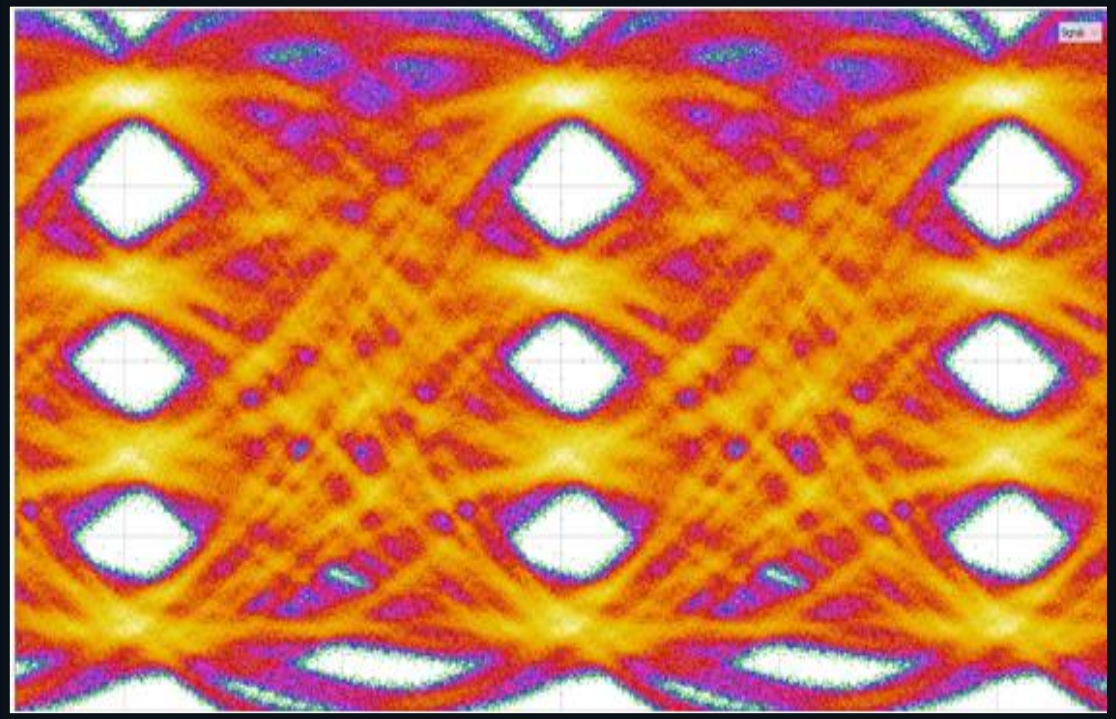
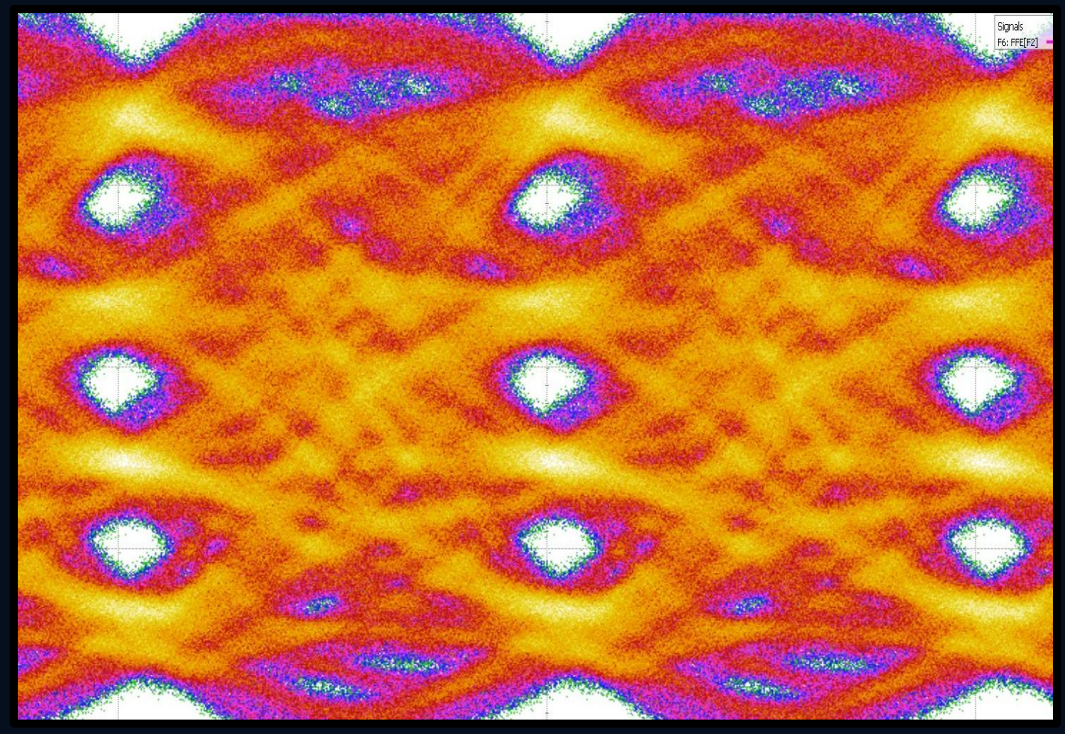
Eye Diagram: Demonstration Results 1550nm

In Pulse Amplitude Modulation 4-level (PAM4) signaling, an "open eye" refers to a clear, distinguishable eye diagram where signal transitions do not overlap, meaning data can be accurately read



100 Gbaud, 200 Gbit/s, V_{pp} = 0.8 V



120 Gbaud, 240 Gbit/s, V_{pp} = 0.9 V

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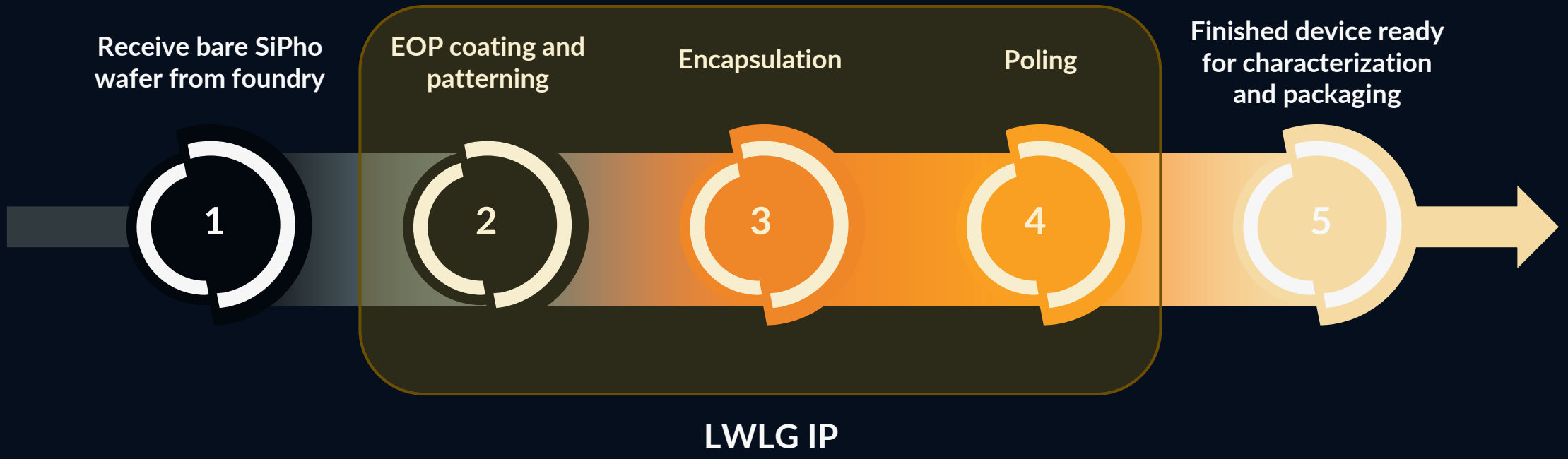
CMOS Compatible Process Flow

LWLG Backend/Encapsulation Process:



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Thank you

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