



LIGHTWAVE LOGIC®
Faster by Design

Annual Shareholder Meeting Management Update

NASDAQ
LWLG

Management Presentation
May 2024

Safe Harbor

The information in this presentation may contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. You can identify these statements by use of the words "may," "will," "should," "plans," "explores," "expects," "anticipates," "continue," "estimate," "project," "intend," and similar expressions. Forward-looking statements involve risks and uncertainties that could cause actual results to differ materially from those projected or anticipated. These risks and uncertainties include, but are not limited to, general economic and business conditions, effects of continued geopolitical unrest and regional conflicts, competition, changes in technology and methods of marketing, delays in completing various engineering and manufacturing programs, changes in customer order patterns, changes in product mix, continued success in technological advances and delivering technological innovations, shortages in components, production delays due to performance quality issues with outsourced components, and various other factors beyond the Company's control.

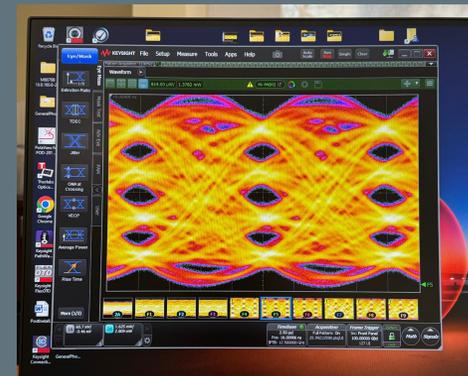
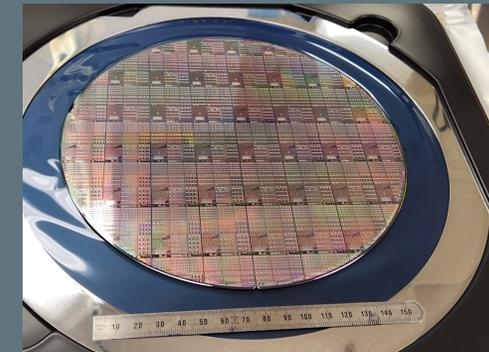
A digital server room with glowing orange data lines and a network overlay. The scene is a perspective view of a long aisle between rows of server racks. The racks are dark with glowing blue lights. A network of white dots and lines is overlaid on the scene. A thick, glowing orange ribbon-like structure curves across the aisle. The ceiling has a grid of blue lights.

*Why Lightwave
Logic... Why now?*



Why LWLG...Why now?

- Silicon photonics has *hit a wall* in performance...
- Our EO polymer material is *world class*...
- We can *turbo-boost* silicon photonics
- Our results this year are creating *excitement* in datacenters



A digital server room with glowing orange data lines and a network overlay. The scene is a perspective view of a long aisle between rows of server racks. The racks are dark grey with glowing blue lights. A network of white dots and lines is overlaid on the scene, and a thick, glowing orange ribbon-like structure curves across the aisle. The ceiling has a grid of blue lights.

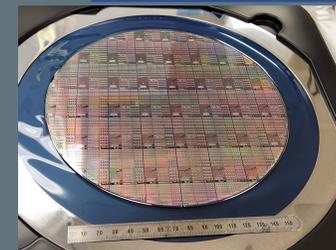
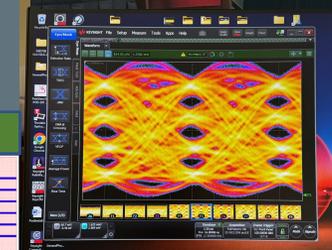
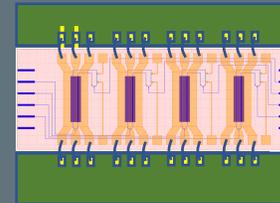
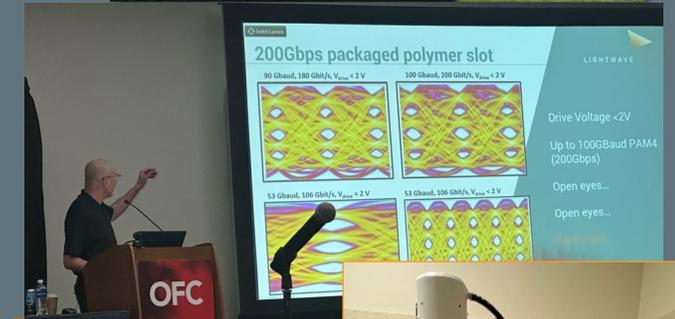
Outline

Outline

- Corporate overview
- Market dynamics
- Polymer roadmap
- Commercial activity
- Business model
- Typical questions
- Summary



LIGHTWAVE LOGIC®



Corporate Overview

Lightwave Logic is positioned for growth by leveraging its proprietary electro-optic polymers to transmit data at higher speeds with less power



Large & Growing Overall Market

Market expected to grow to ~\$100B by 2030 driven by data centers, comm & AI requirements



Robust Patent Portfolio

70+ patents and patents pending



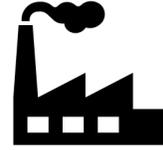
Proprietary EO Polymer Technology

Supports >3x faster data transmission speeds with ~10x lower power, relieving bottlenecks in internet infrastructure



Experienced Leadership:

Management, TAB, and Board are composed of technology & finance experts with 200+ years of combined experience



Commercialization Underway

Secured initial licensing agreement in May '23



Robust Balance Sheet

\$31M+ cash for growth
No debt



LIGHTWAVE LOGIC

NASDAQ
LWLG

Share Price ¹	\$3.90
Market Cap ¹	\$468.4M
Cash & Cash Equivalents ²	\$31.5M
Debt ¹	\$0
Shares Outstanding ¹	120.1M
Headquarters	Englewood, CO

1) As of May 17, 2024
2) At Mar. 31, 2024

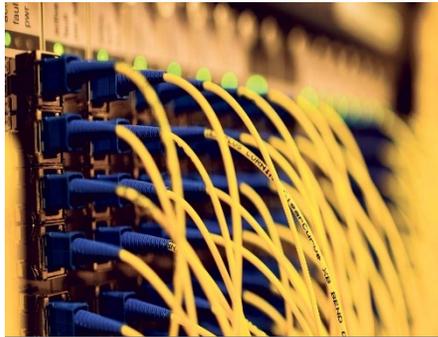
A digital server room with rows of server racks on both sides. A glowing orange wave, composed of many thin lines, curves across the center of the image. The background is dark with a network overlay of white dots and lines. The ceiling has blue rectangular light fixtures. The floor is dark with a grid pattern.

Market dynamics

Industry Demand Drivers

Macro-tailwinds driving adoption of next-generation components

Switch Density



Need For Space

Real Estate Efficiency

AI, Cloud & Streaming



Need For Speed

Artificial Intelligence
Cloud Services
Streaming/Gaming

Energy Usage

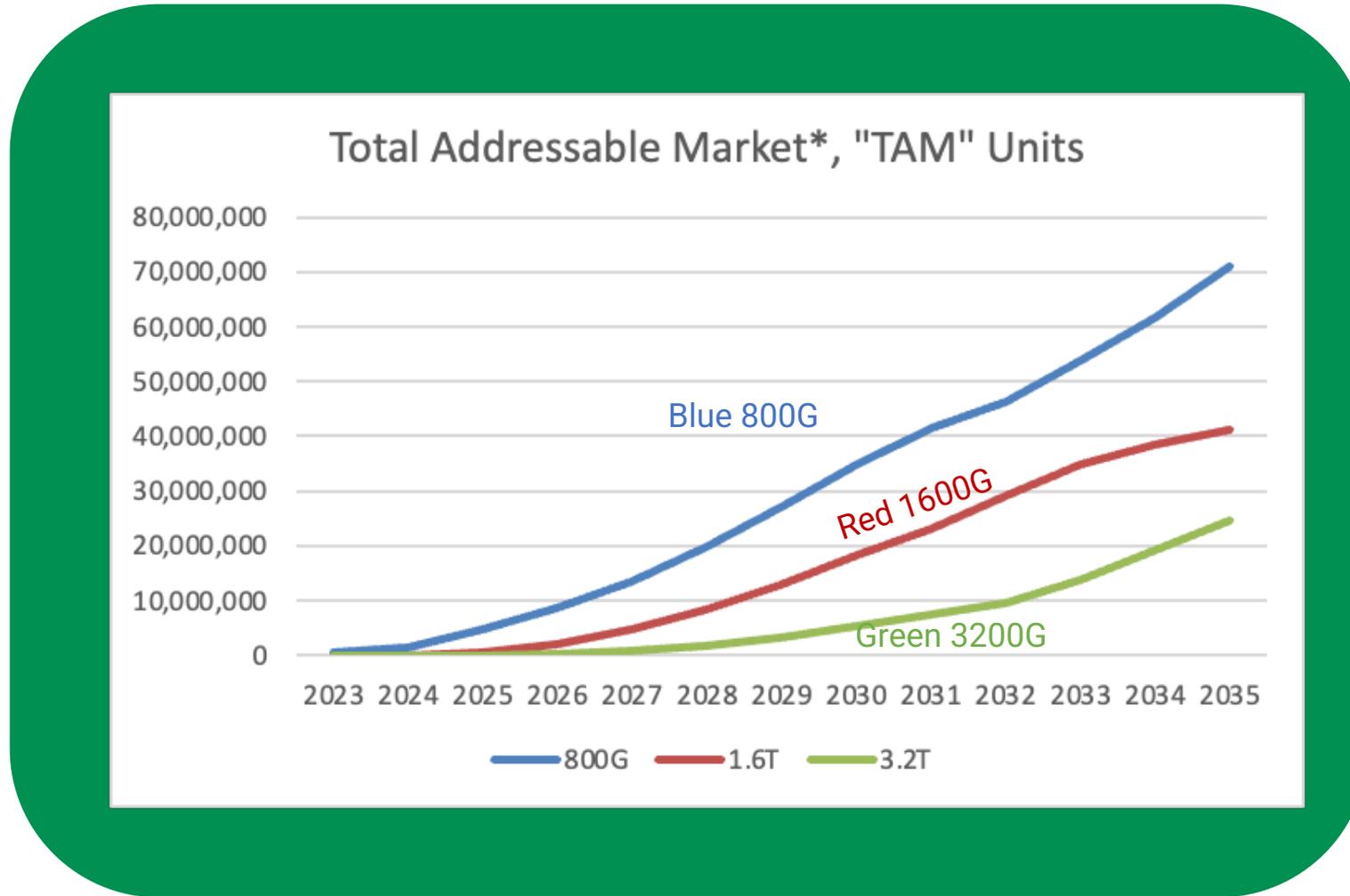
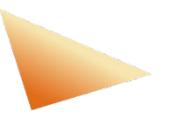


Need For Green

Energy Demand

Supporting the big macro trends today...and in the future

Total Addressable Market, TAM



>120M units

Source: <https://www.lightcounting.com/newsletter/july-2021-mega-data-center-optics-104>

***TAM is for 800, 1600 & 3200 datacom segments only and does not include other fiber comms**

A futuristic server room with rows of server racks on both sides. A glowing orange wave graphic, composed of many thin lines, curves across the center of the image. The background is dark with a network overlay of white dots and lines, and a blue grid pattern on the ceiling. The overall atmosphere is high-tech and digital.

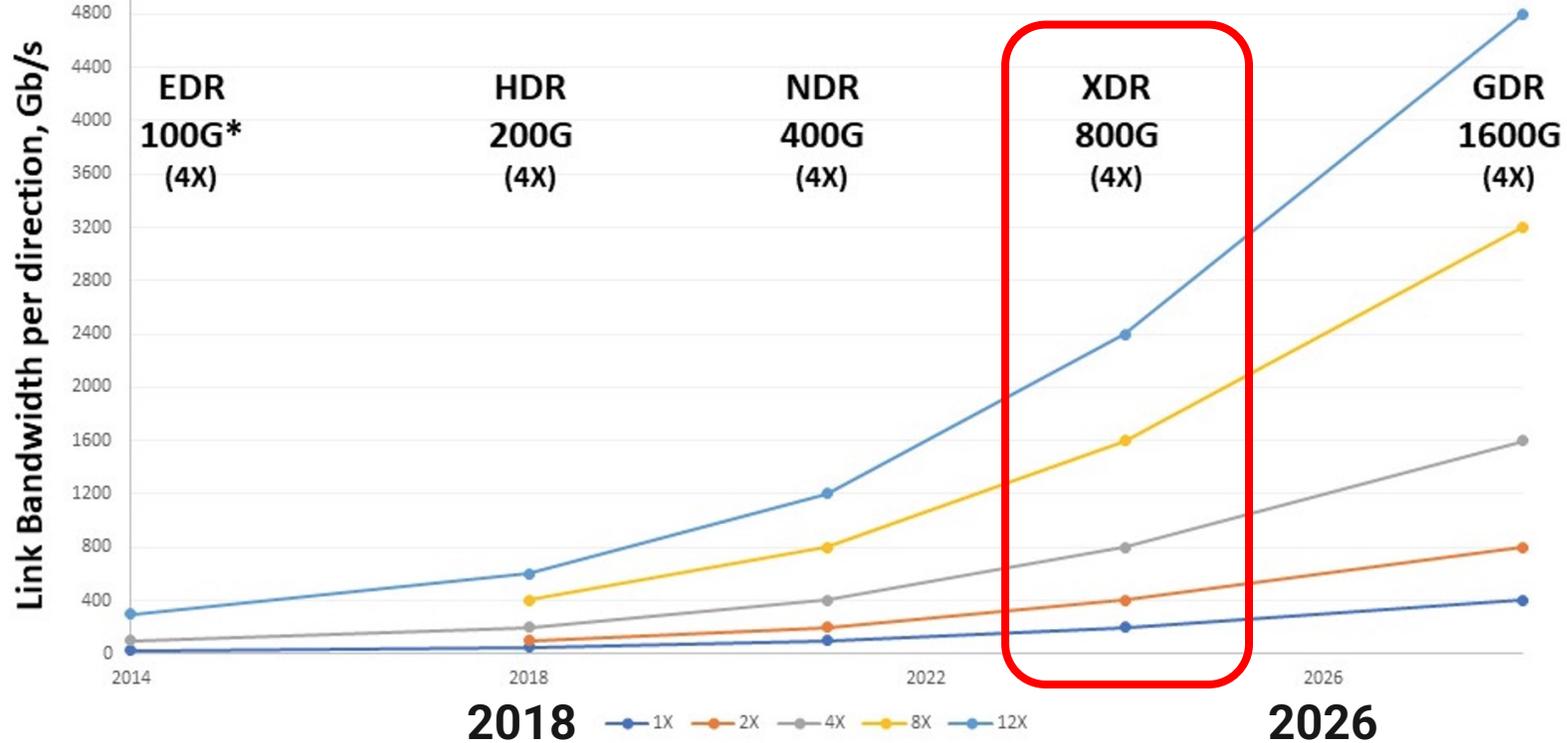
Polymer roadmap for next decade...



Industry roadmap to higher speeds

InfiniBand Roadmap

4.8Tbps



Next is 800G...

*Link speeds specified in Gb/s at 4X (4 lanes)



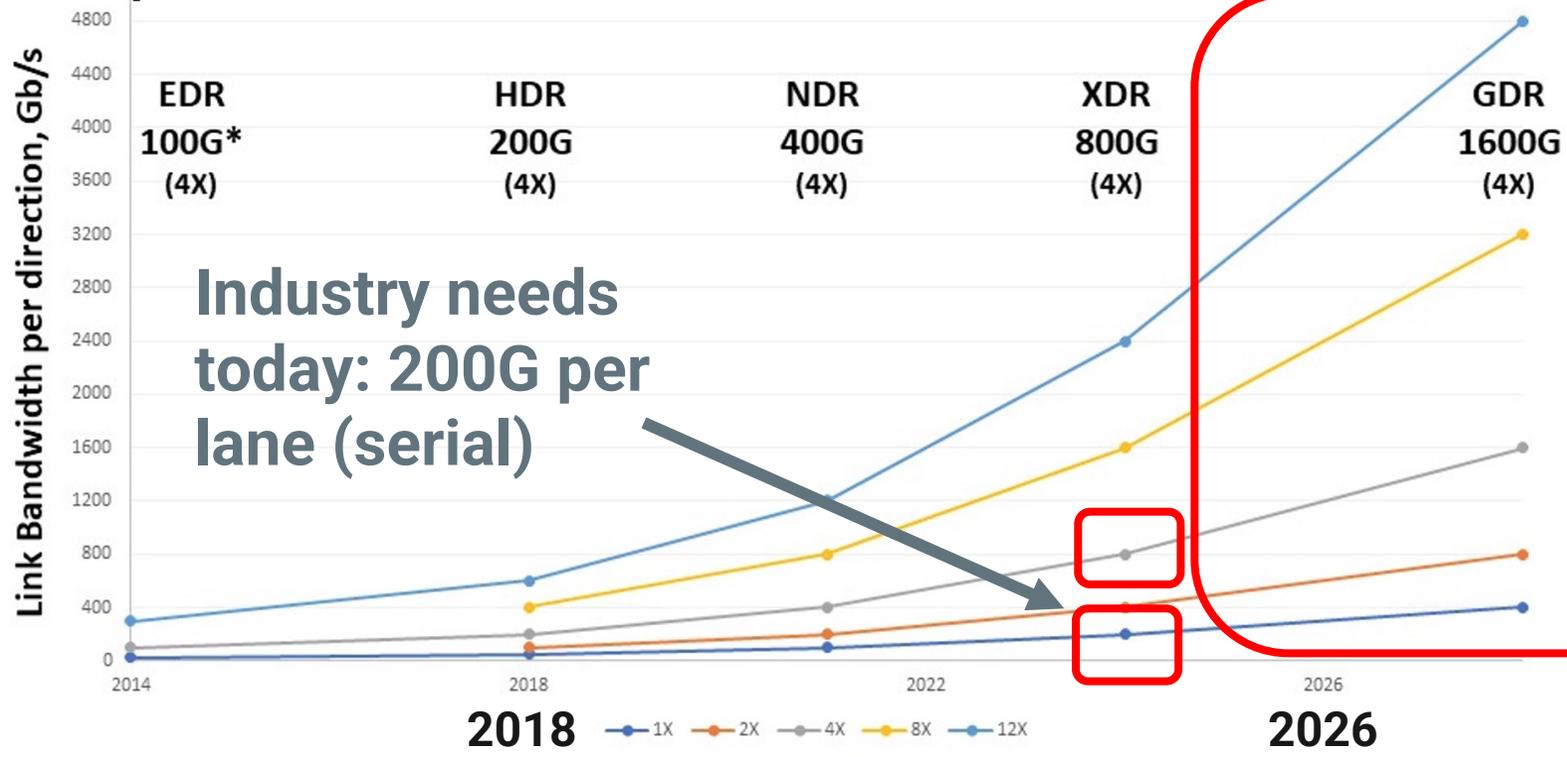
Drive to higher lane speeds



InfiniBand Roadmap

Where the industry wants to go...

4.8Tbps



Industry needs today: 200G per lane (serial)

“in many ways polymers will be an ideal enabler of the growth expected in Infiniband usage”

Infiniband is a key enabler for NVIDIA → higher speeds are required now

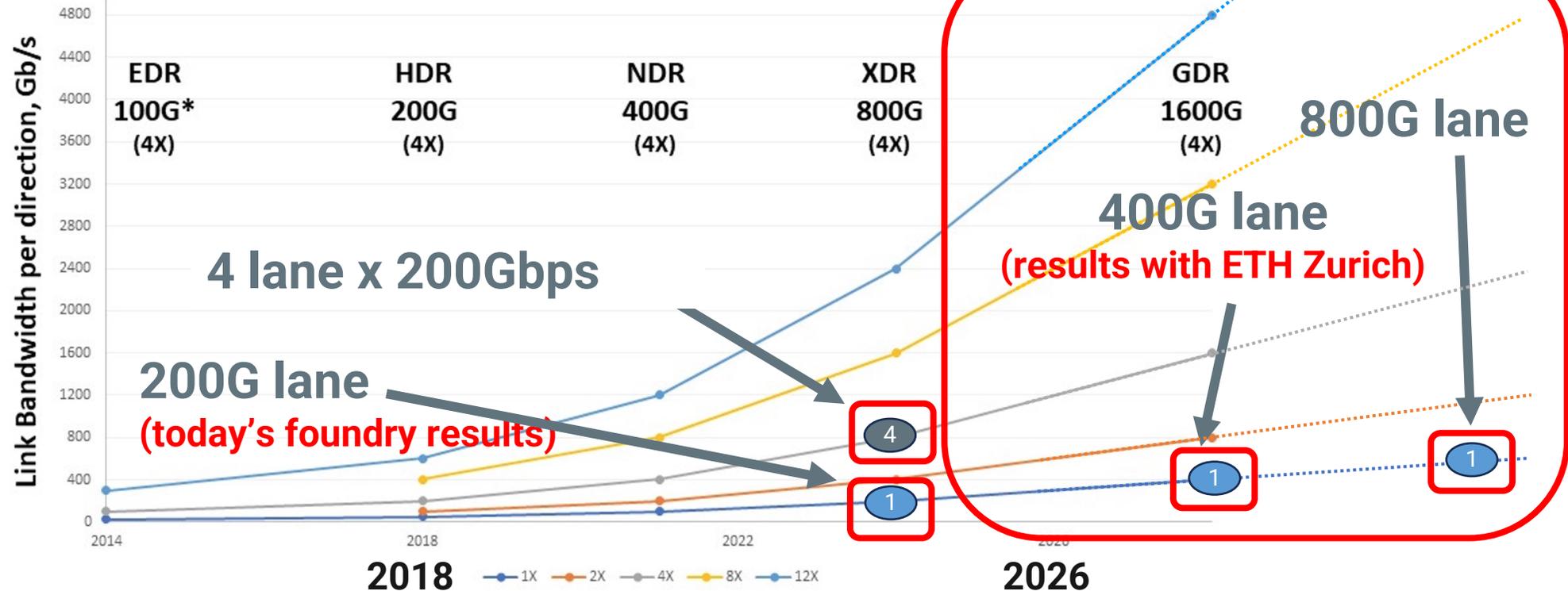
*Link speeds specified in Gb/s at 4X (4 lanes)



Industry drive to higher lane speeds

InfiniBand Roadmap

4.8Tbps



*Link speeds specified in Gb/s at 4X (4 lanes)

©

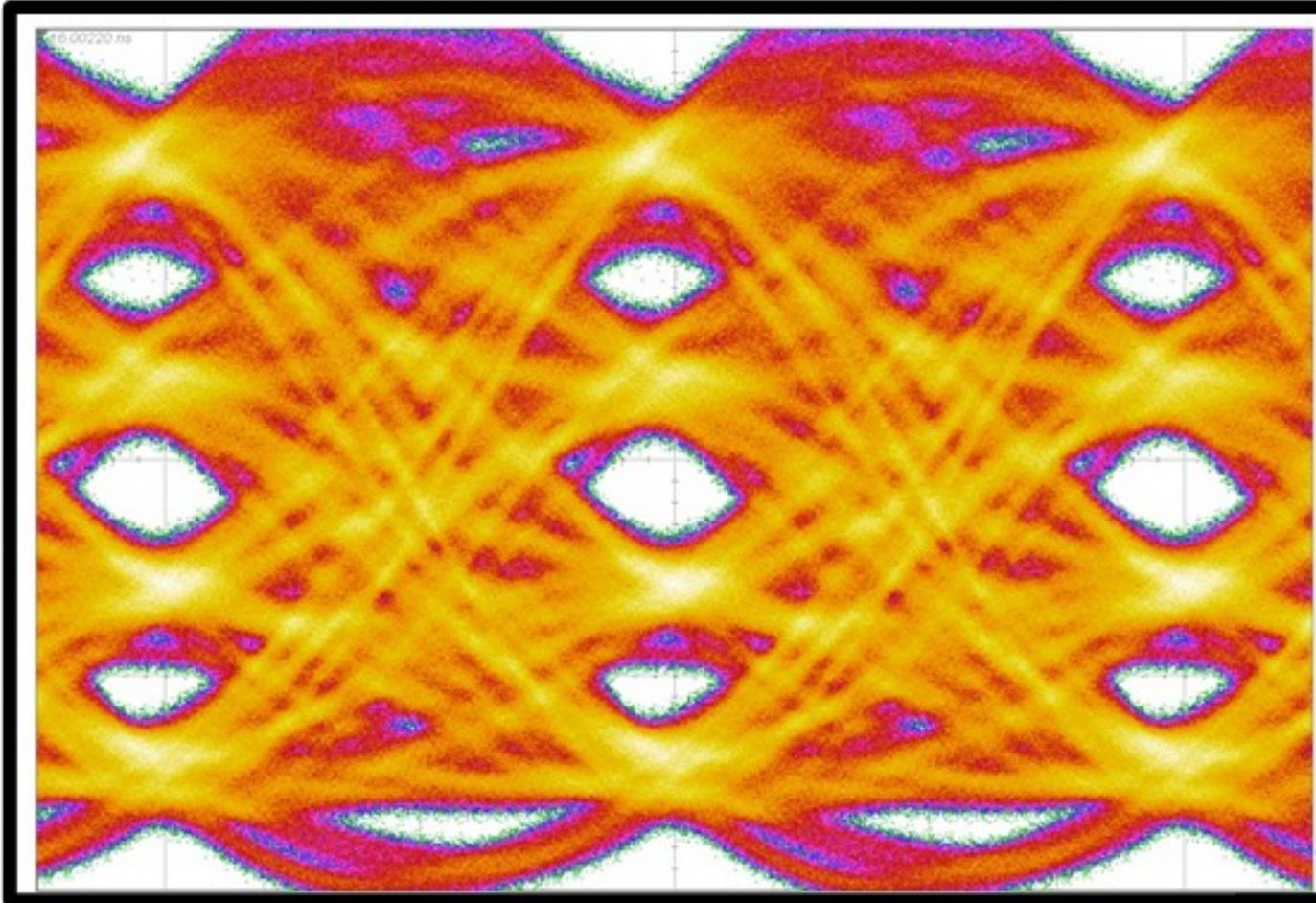


Our recent results are important step forward for us



World-class performance...

100 Gbaud, 200 Gbit/s, $V_{\text{drive}} < 1 \text{ V}$



Drive Voltage $\sim 1 \text{ V}$

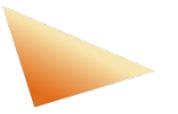
Up to 100GBaud PAM4
(200Gbps)

Open eyes...

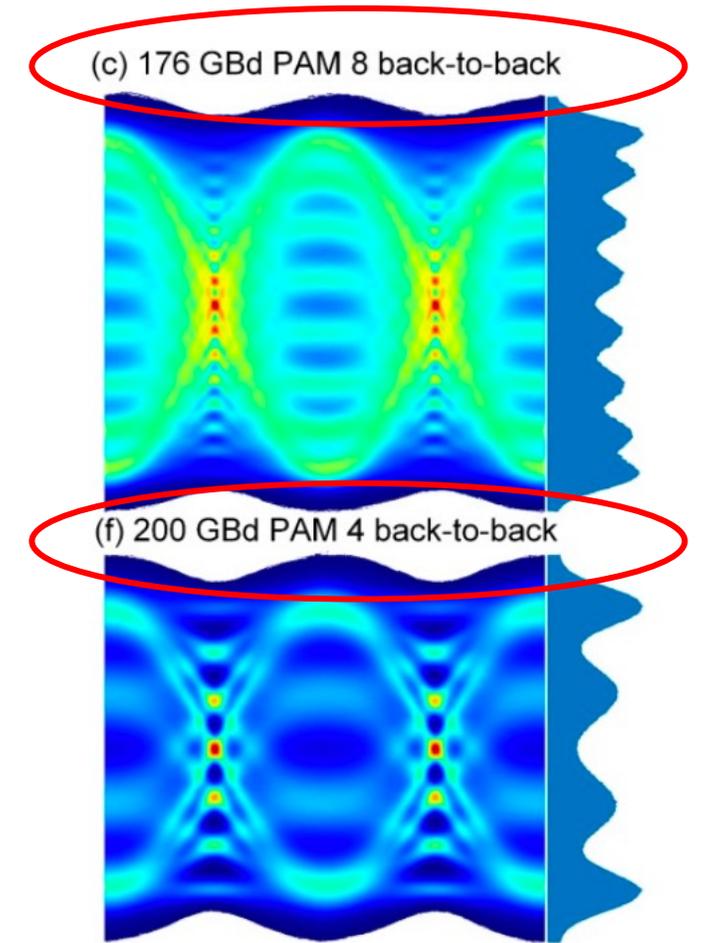
Open eyes...

Ideal for low voltage
800Gbps 4 lane pluggable
transceivers

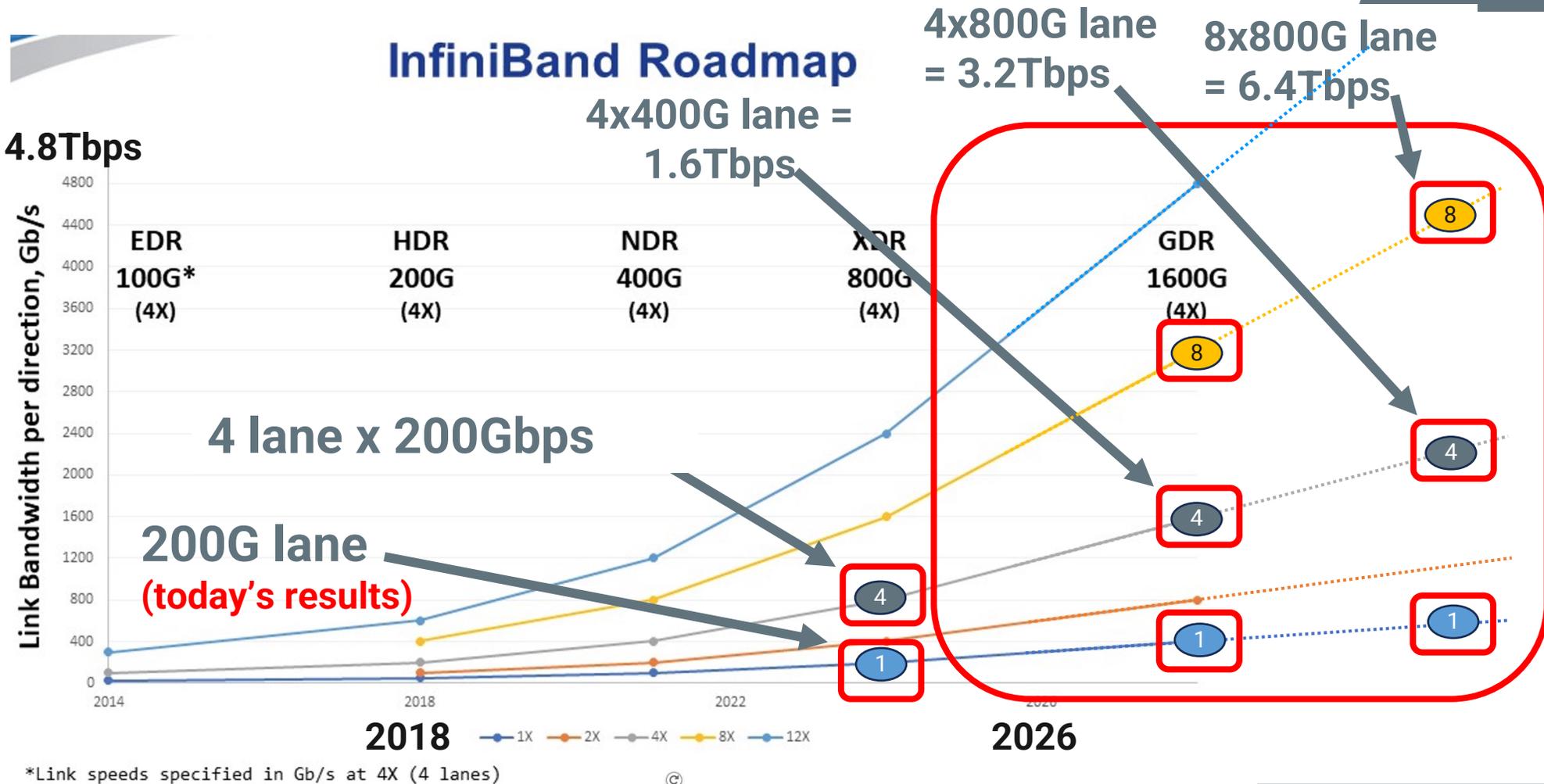
3rd party use of Perkinamine® LWLG polymers



- *World class performance EO polymers* used for *400G lanes*
- Next generation node for datacenters
- Potential to enable 4 lane pluggable transceiver at 1.6Tbps & 8 lane at 3.2Tbps

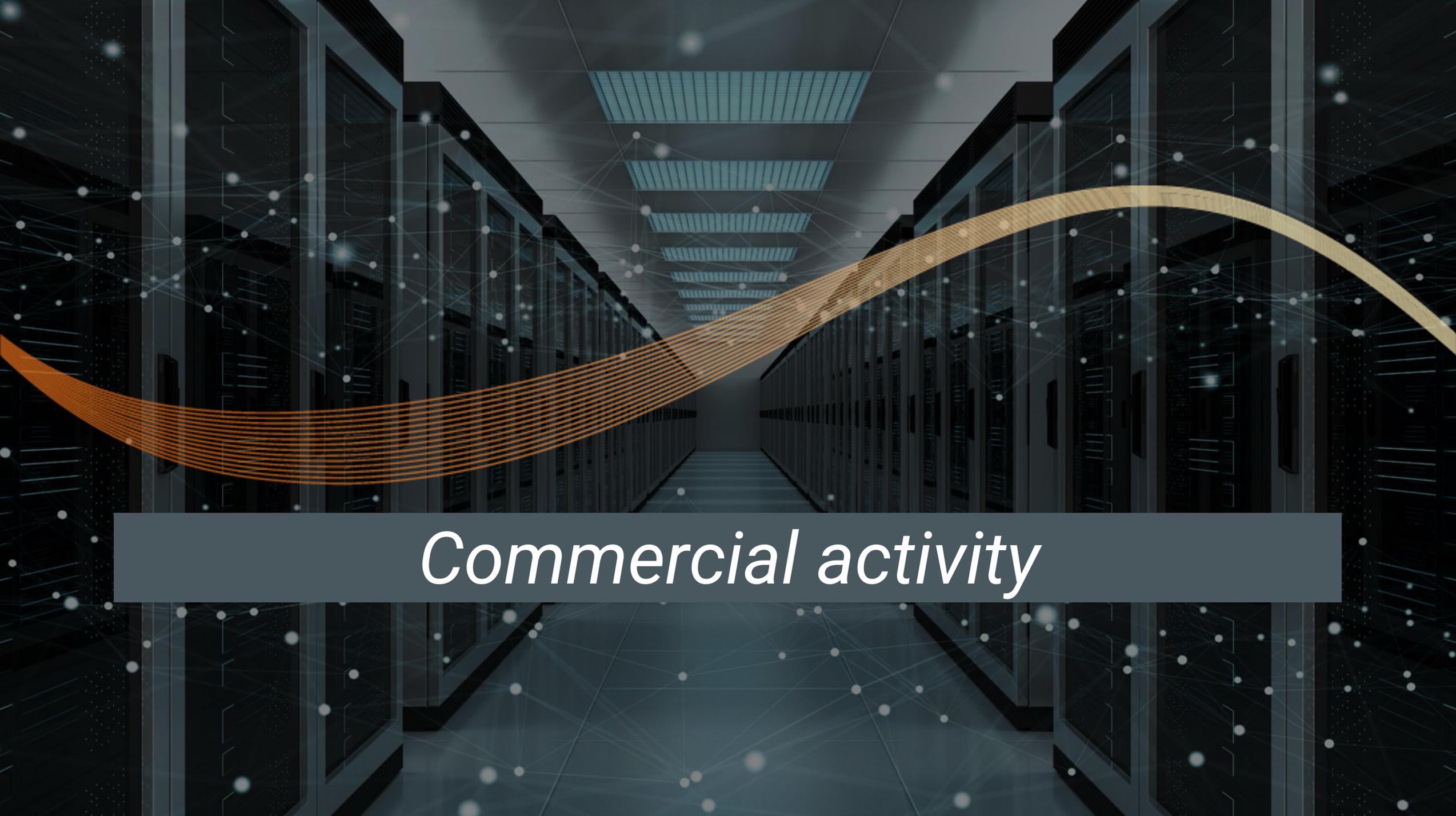


Industry roadmap...



Polymers fill the roadmap...



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Commercial activity

Scaling Growth...

We have the team and facilities to make polymer chromophore and polymer slot modulators ubiquitous

Expanded Lightwave Logic facility operational:

- Acquired almost 10,000 sq ft adjoining current facility, representing a 70% increase in available space
- Fully utilized for manufacturing test/analysis



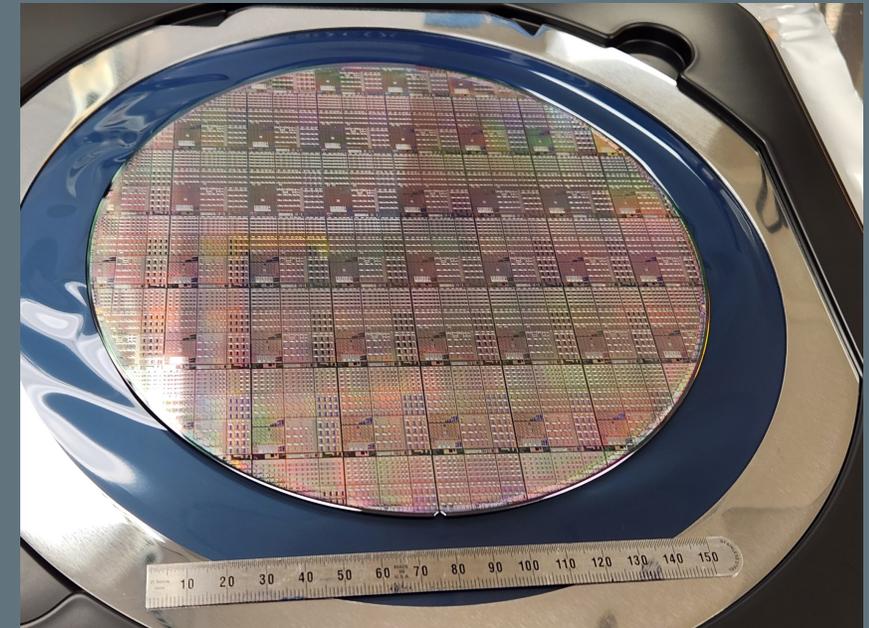


Leveraging silicon eco-system

- Polymers *can easily* fit into silicon foundries compared to legacy and new exotic materials
- Polymers *extend* silicon photonics performance
- Polymers *meet* the performance for datacenter applications

Commercial Foundry

200 mm Wafer



Commercial Partnering – AMF foundry

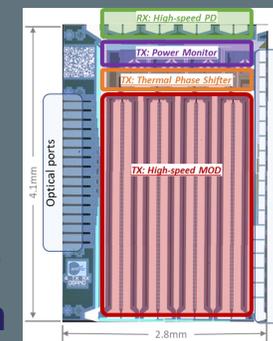
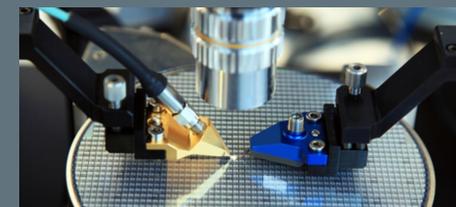
- Turbo-charging silicon photonics
- Partnering for polymer slot modulators on 200mm silicon wafers
- Combined PR released this week



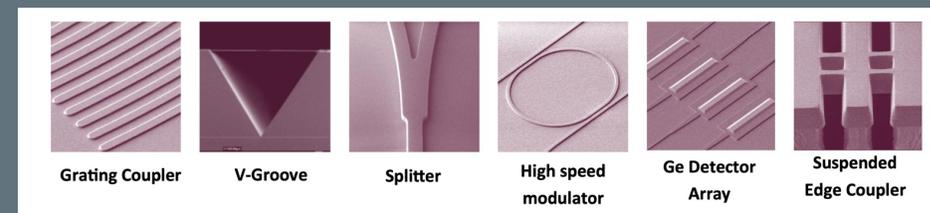
LIGHTWAVE LOGIC®



A High Mix specialty commercial foundry for integrated optics manufacturing



AMF Transceiver Reference Design

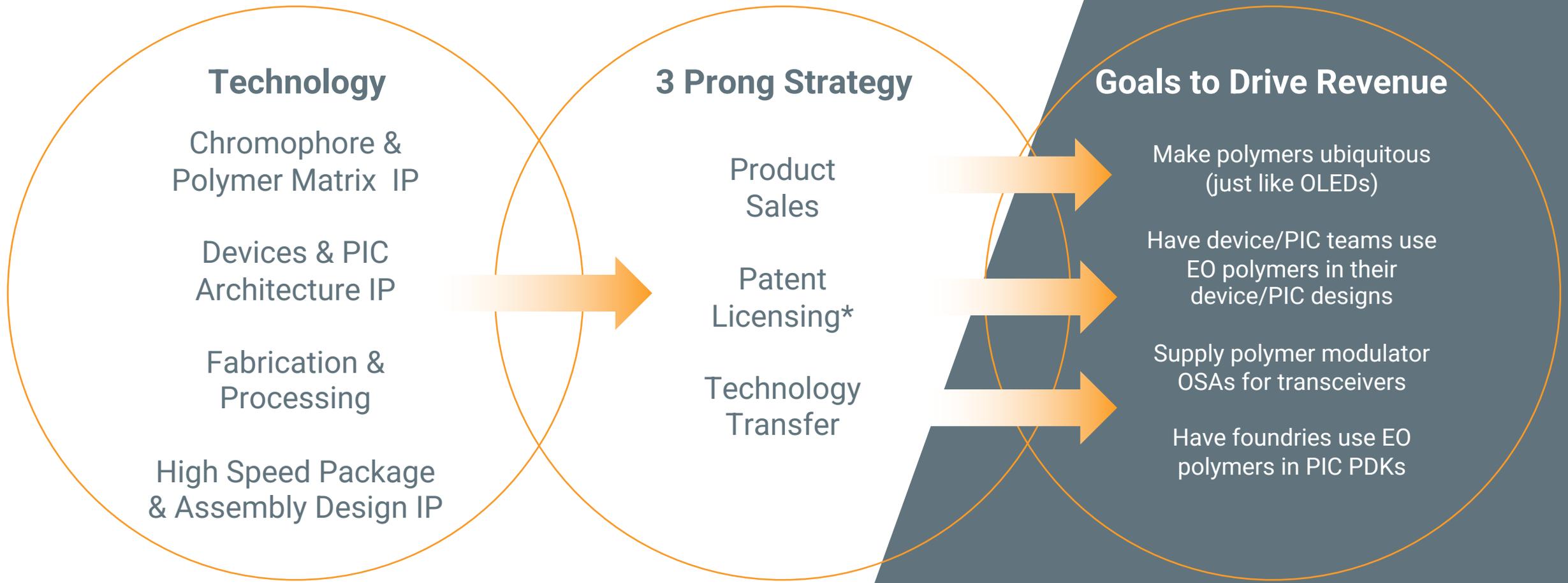


Comprehensive PDK



Implementing a New Technology Platform

Licensing model provides inherent scalability

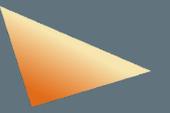


Patent licensing and product sales to drive revenue

Case Study

Case Study for OLEDs (Organic Light Emitting Diodes)

- A polymer business driven in part through innovative licensing and material sales.
- Ubiquitous technology in displays such as smartphones, TVs, monitors etc.
- Blueprint for **commercializing our innovative polymers in the datacenter industry**



LIGHTWAVE LOGIC®

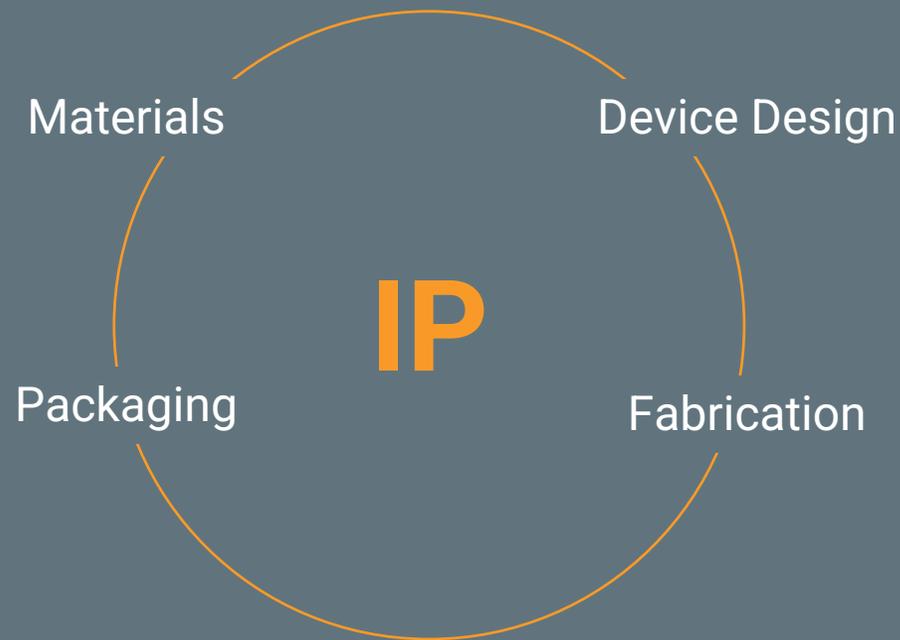


Patents Drive Licensing Opportunities



LIGHTWAVELOGIC®

Robust intellectual property (IP) portfolio enables licensing & tech transfer for long term revenue generation



- Develop and license polymer-based technologies
- Strong moat and know-how
- Over **70 patents** issued and pending

Focus on data communications, datacenter market segments

Licensing Strategy

Goal is to create volume for Perkinamine[®] to become Ubiquitous...

- Increase license deals to supply Perkinamine[®] series EO material
- Utilize our first licensee's product for
 - Market acceptance (our polymers are being sold today as packaged parts)
 - EO material verification
 - EO material stability
 - EO material performance
- Focus on Tier 1 customers
 - Volume scale material supply
 - Volume scale licensee device design
 - Volume scale licensee manufacturing

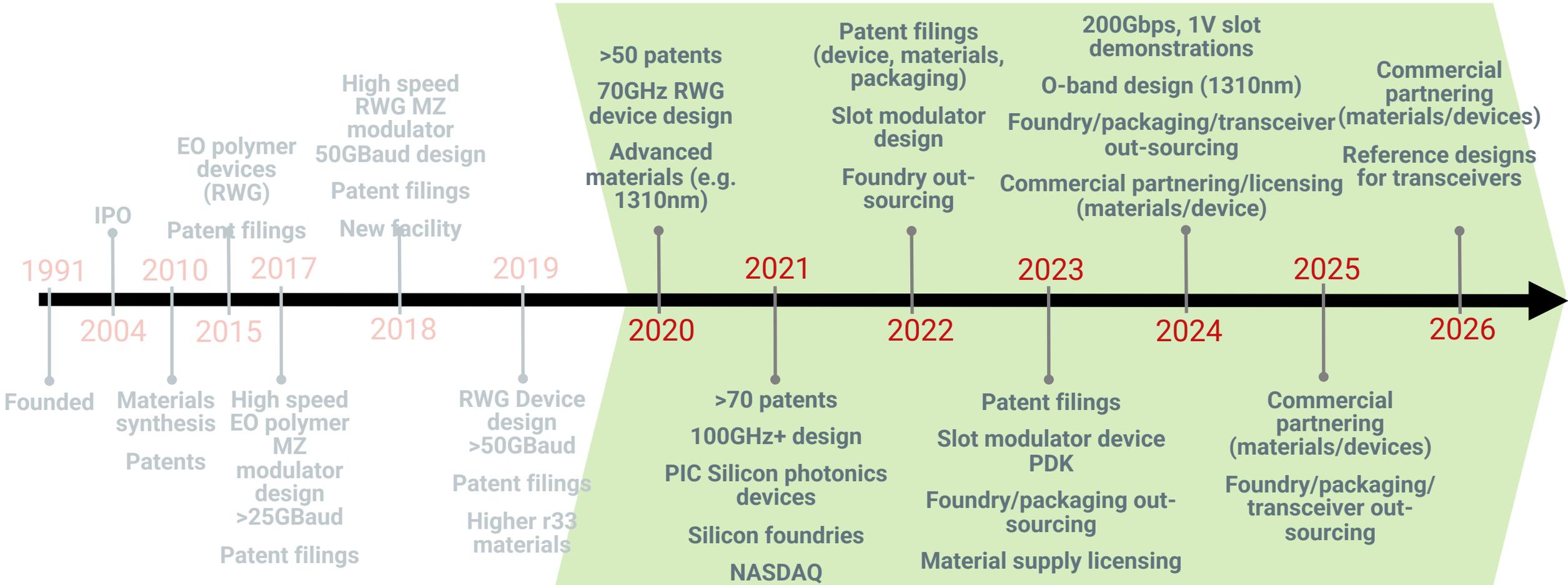


Increase commercial market acceptance of our polymers, with follow-on licensees in progress



Maturing our Perkinamine® platform

We are *enabling* polymer devices to *extend* silicon photonics using our EO polymers...



Maturing our electro-optic polymer platform using partnering

Perkinamine® chromophores

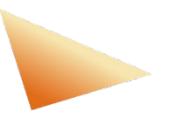


LIGHTWAVELOGIC®



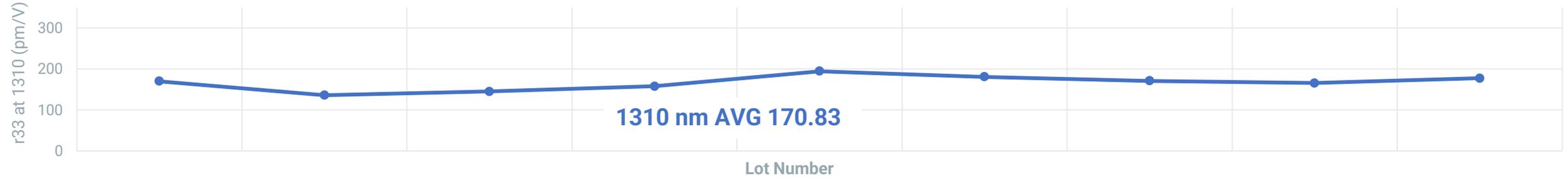
Materials are ready for volume scale today

Lot Uniformity



LIGHTWAVELOGIC®

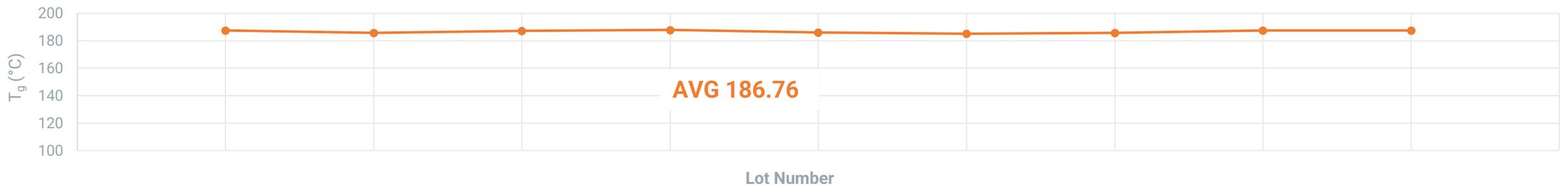
r₃₃ @ 1310 nm per Lot



Purity (%) per Lot



T_g (Glass Transition Temp) per Lot



Product Roadmap



LIGHTWAVELOGIC®

Key

Development

In qualification

Available

Electro-optic materials



MATERIALS

Perkinamine® chromophore platform

P²PIC™ platform



NEW MATERIALS

PkM-6 series (designed for 400G lanes)

Package platform



PACKAGING

Package/Optical sub-assembly (4 lane)



PIC & Silicon Photonics

4 lane @ 200Gbps

Time

Our technology roadmap emphasizes our unique value for commercialization

Near Term Commercial Activities & Goals

Initial commercial activity developing well and is expected to grow in 2025





Commercial interest growing

Recent technology demonstrations of our polymer modulators

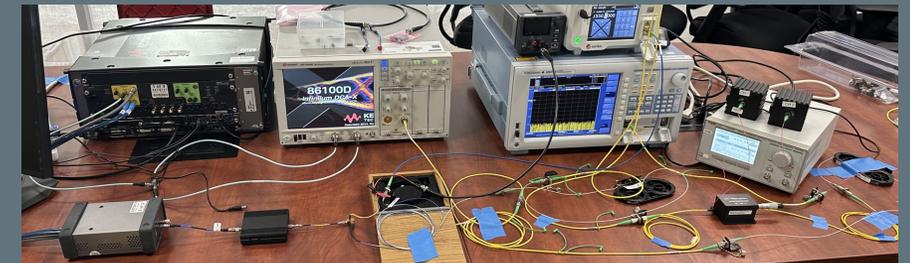
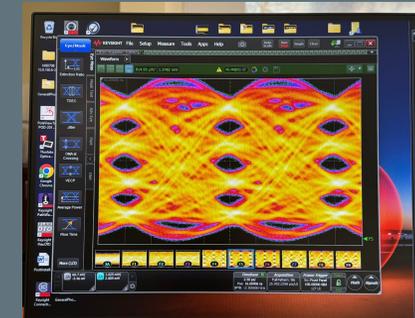
World class results

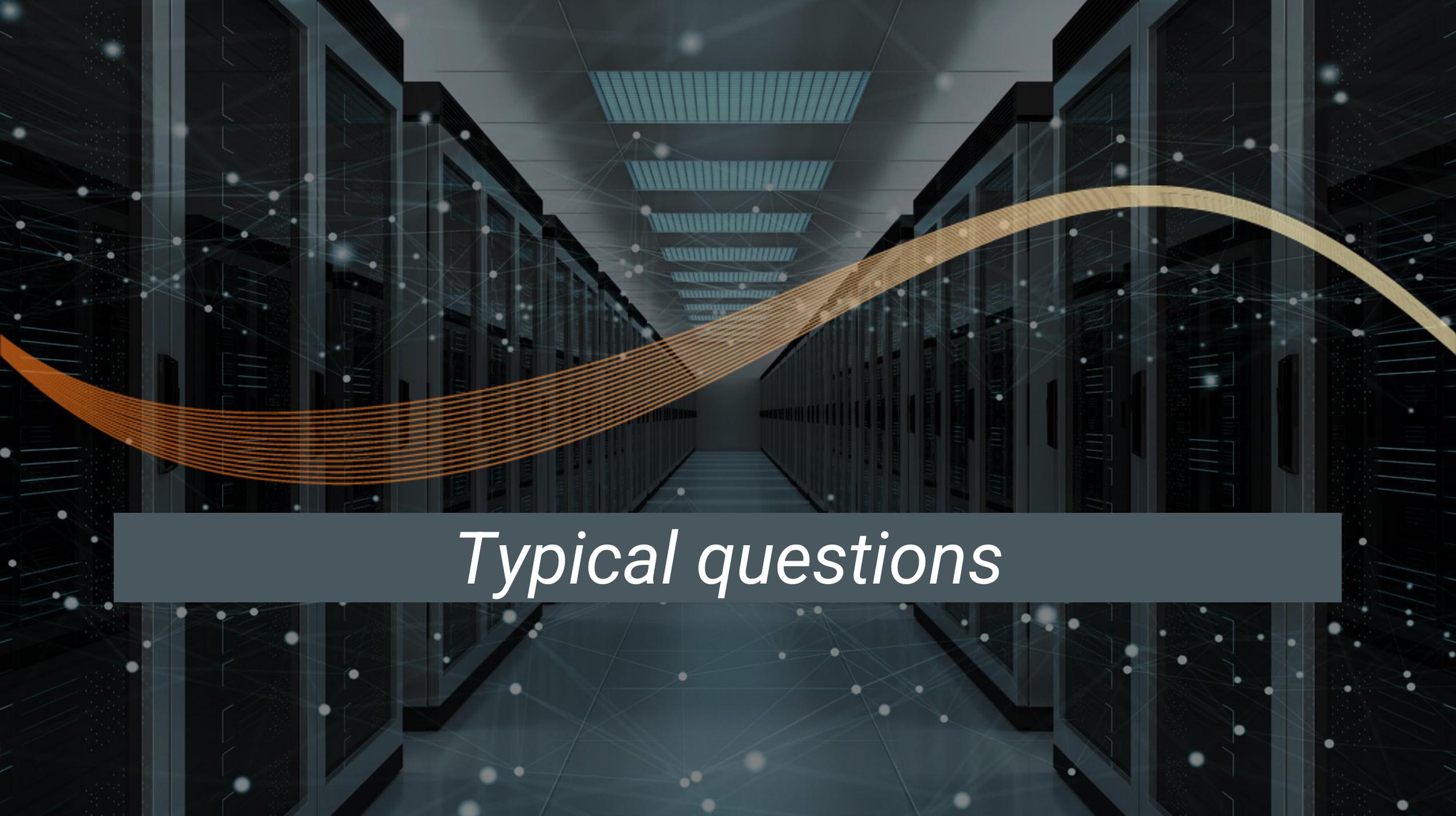
- Ideal for 800Gbps pluggable transceiver market with 200G lanes

Types of visitors

- Commercial Tier 1 companies include:
 - Hyperscaler/Datacenter companies
 - Telecom system companies
 - Optical system corporations
 - Optical component/transceiver corporations
 - OSATs (Outsources Semiconductor Assembly and Test)
 - CMs (Contract Manufacturers)
 - Silicon Foundries
- Research analysts
- Universities
- Defense industry
- **Combined licensing/product interest**

Over 25 commercial visitors this year



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Typical questions

Typical questions over past 12 months



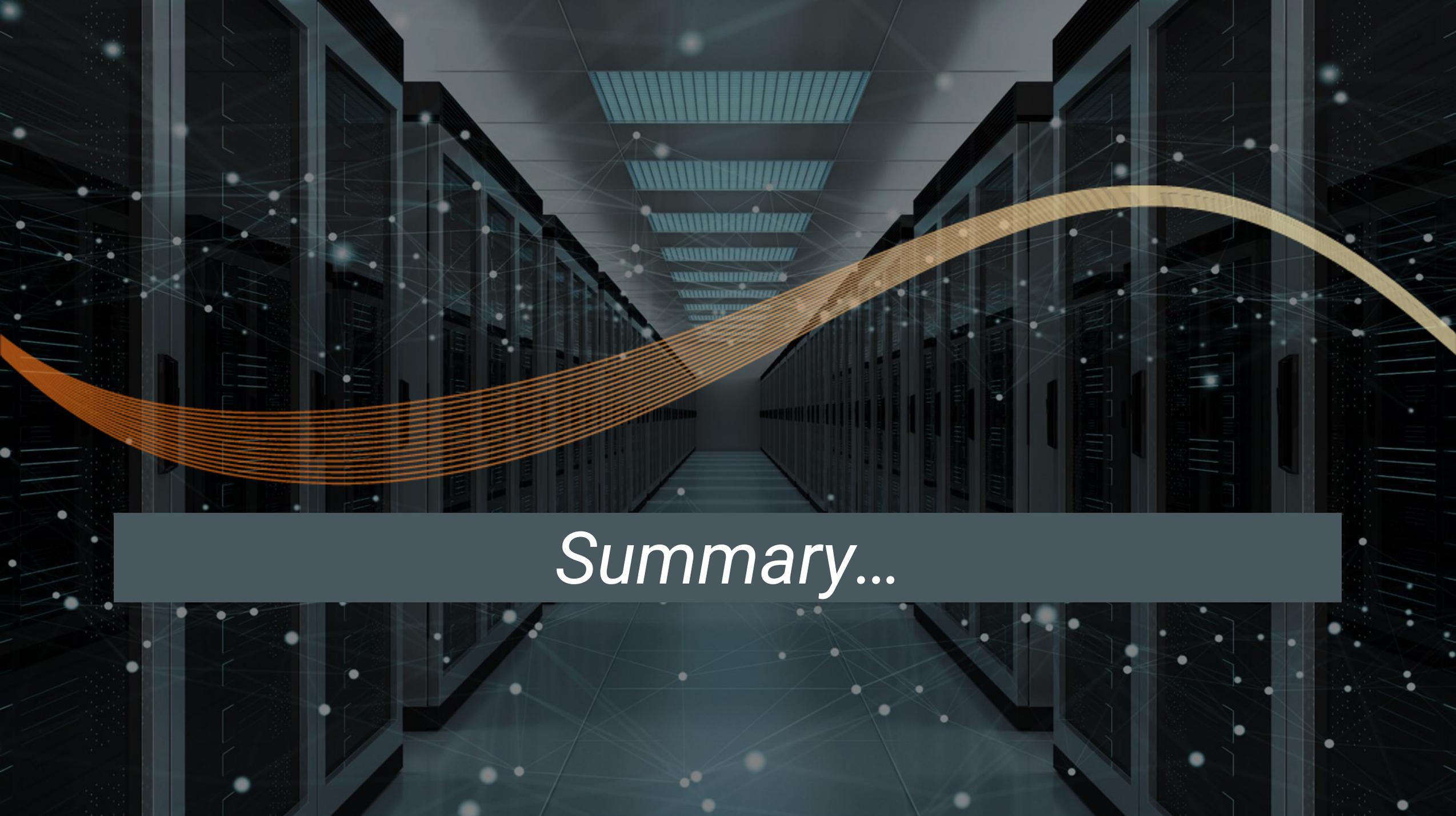
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COMMERCIAL & BUSINESS QUESTIONS	ANSWERS
When is our 2 nd license deal coming?	We are focusing on license deals with a number of companies that range from Tier 1 to 2, and 3. We are aiming for Tier 1 licensing, and these deals are complex and methodical.
When will our foundry partner be named?	We did so with one of our foundry partners this week. AMF
How much reliability data is needed to secure more license deals?	We have built a world-class team and we are generating material, device R&QA data that customers have requested. Our reliability data is stable and performs well.
Are you going to raise capital?	We are in constant contact with the banking community, and regularly have meetings, visits, and talks – so there is optionality on that front to fortify our balance sheet for tier-1s as needed.
What are you doing to enhance your IR and PR efforts?	We have a very active IR and PR team, with very regular meetings. We challenge our IR and PR team to position the company in exciting growth markets. The relationship is strong and we have received great speaking, op-ed, and interview slots over the past year.
Are you building LWLG to be acquired or to operate as a stand-alone company?	We are building a stand-alone company with our unique technology platform to increase commercial value for our shareholders. We'll do whatever is best for our shareholders.
When will LWLG given revenue guidance?	We will publicize when ready.
What is LWLGs potential market share and adoption rate?	Our first market is the hyperscaler datacom/datacenter market as optical engines for pluggable transceivers both by material as well as modulator product. We expect the adoption rate to quickly replace incumbent technology. We also see our material being utilized in other markets such as instruments, scientific, as well as consumer.
Is the current state of the company's technology enough for commercialization of product polymer modulators	Our current modulator performance is suitable for live trials with hyperscaler datacom companies. We are engaged with customers including Tier 1s, and we are providing reliability data.
Will LWLG supply modulators for transceivers?	We are making polymer modulators that are specified for pluggable transceivers at 800G using our polymer material production in LWLG Colorado as well as polymer materials for licensing

Typical questions continued...



TECHNICAL QUESTIONS	ANSWERS
Will all of the modulators be under 1V and over 70GHz?	Device performance is working well with voltage levels under 2V. Bandwidths of 70GHz are fine for 200G systems today.
Do you expect competition to take significant market share? Which is your biggest competitive threat?	We do see other technologies that are positioning as competitors (BTO, TFLN, Si rings) however, we believe that none of these have the performance headroom as our polymers over the next decade to go beyond 200G with 4/800G. As or right now TFLN is a threat.
How is testing completed? At LWLG or at the foundry? Will poling be wafer scale, and automated?	Testing is undertaken at LWLG and at a certain volume will transfer to foundries.
Will there be standards for modulators that would allow for different materials (TFLN, BTO, Polymer) etc.?	Standards take 2-4yrs, and MSAs take 2-3 years. We do not see customers waiting for standards to implement our modulators
What is the difference between Perkinamine 2, 3, 5, and 6? How is Perkinamine 6 better?	Each polymer material has different characteristics, and thus alignment with customer specifications. R33, optical loss, Tg are key metrics and Perkinamine 6 is highly stable with improved R33.
What performance is needed for 400G lanes?	We expect that 400G lanes will use 8x200G, but also 4x400G with polymer modulators that have around 130-150GHz bandwidths.
BUSINESS MODEL QUESTIONS	ANSWERS
What will come first: licensing or product revenue and which do you expect to drive company revenues?	We expect licensing materials initially and then followed by product revenue. We expect both to drive our revenues.
How long does it take to design in for a datacenter customer Tier1?	Given G-AI, design in cycles have shortened that range from 20-50% depending on each customer. Our flexible business model allows us to work with OEMs, CMs, and their relationships with foundries.
Can you scale volume efficiently?	We can scale materials in LWLG Colorado, and devices using silicon foundries.

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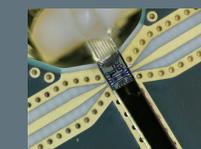
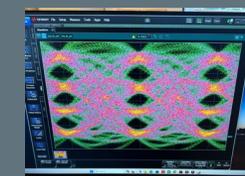
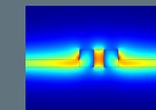
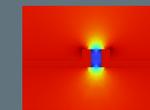
Summary...

Summary

Turbo-charging silicon photonics with polymers for commercial traction...

- **Large & Growing Addressable Market:** Optical pluggable transceivers market >\$100B by 2030
- **Proprietary EO Polymer Technology:** Demonstrated 200Gbps 1V performance in 2024.
- **Commercialization Underway:** Increased activity from packaged slot modulator demonstrations for material supply licensing and prototyping from Tier 1s
- **Robust Patent Portfolio:** Over 70+ patents and patents pending
- **Robust Balance Sheet:** \$30M+ cash position provides significant optionality
- **Building a Foundation:** Partnering with commercial silicon foundry for 200mm wafers.

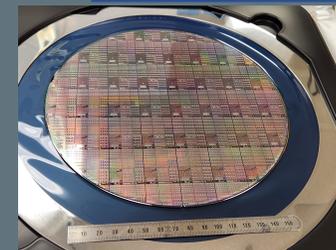
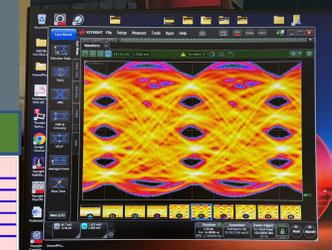
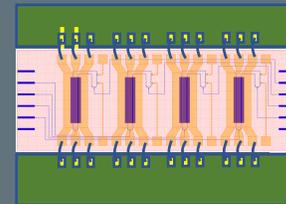
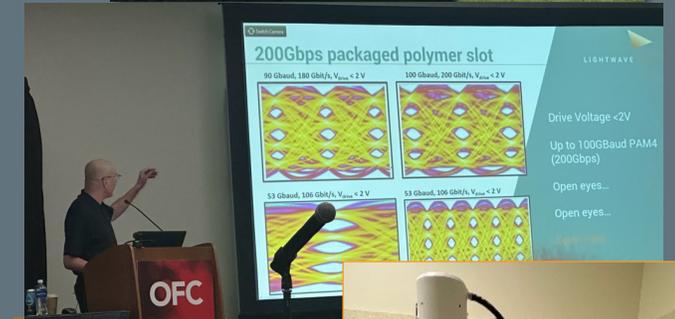
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Visit logistics

- Security and information policy
- Tours will be small groups of 6-8 folks
- Bus has been set up at Hotel entrance (3mins from the hotel)



Investor Relations Contact

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LIGHTWAVELOGIC®

Faster by Design

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