

POET Technologies Inc.

POET: NASDAQ | PTK: TSXV

Meeting with Debenture Warrant Holders
6:00pm EDT, Wednesday, Sept. 7, 2022

Safe Harbor

This presentation contains forward-looking statements and forward-looking information within the meaning of U.S. and Canadian securities laws, including but not limited to statements relating to revenue potential, growth and/or projections, as well as the expected performance of products.

Forward-looking statements and information can generally be identified by the use of forward-looking terminology or words, such as, "continues", "with a view to", "is designed to", "pending", "predict", "potential", "plans", "expects", "anticipates", "believes", "intends", "estimates", "projects", and similar expressions or variations thereon, or statements that events, conditions or results "can", "might", "will", "shall", "may", "must", "would", "could", or "should" occur or be achieved and similar expressions in connection with any discussion, expectation, or projection of future operating or financial performance, events or trends. Forward-looking statements and forward-looking information are based on management's current expectations and assumptions, which are inherently subject to uncertainties, risks and changes in circumstances that are difficult to predict.

Such forward-looking information or statements are based on a number of risks, uncertainties and assumptions which may cause actual results or other expectations to differ materially from those anticipated and which may prove to be incorrect. Assumptions have been made regarding, among other things, management's expectations regarding Such statements include the Company's expectations with respect to the success of the Company's joint venture, product development efforts, the performance of its products, the expected results of its operations, meeting revenue targets, and the expectation of continued success in its financing efforts, the capability, functionality, performance and cost of the Company's technology as well as the market acceptance, inclusion and timing of the Company's technology in current and future products, plans for and completion of projects by the Company's third-party consultants, contractors and partners, and the necessity to incur capital and other expenditures. Actual results could differ materially due to a number of factors, including, without limitation, operational risks in the completion of the Company's anticipated projects, delays or changes in plans with respect to the development of the Company's products, a delay in or failure to deliver needed supplies or services from any of the Company's suppliers, risks affecting the Company's ability to execute projects, the ability of the Company to generate interest in or sales for its products, the ability to attract key personnel, and the ability to raise additional capital. Although the Company believes that the expectations reflected in the forward-looking information or statements are reasonable, the prospective investors in the Company's securities should not place undue reliance on forward-looking statements because the Company can provide no assurance that such expectations will prove to be correct. Forward-looking information and statements contained in this presentation are as of the date of this presentation and the Company assumes no obligation to update or revise any forward-looking information and statements except as required by law.

Other than any obligation to disclose material information under applicable securities laws or otherwise as may be required by law, the Corporation undertakes no obligation to revise or update any forward-looking statements after the date hereof.

AGENDA

Sept. 7, 2022



- **Introduction and Agenda** – Thomas Mika, CFO
- **Update on Product Development & Operations** – Suresh Venkatesan, Chairman & CEO
 - Review of Selected Slides from August Investor Deck
 - Preview of CIOE
- **Mechanics of Warrant Exercise** – Kevin Barnes, VP Finance
- **Q&A** – Send me a chat with your name only if you have a question

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Key challenges in Photonics

Current technologies are not scalable for applications needing 100's of millions and billions of units per year

Millions/Year

VECTOR	CURRENT TECHNOLOGIES	POET	REASON
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Unit Volume

X

✓

Manufacturing, test and packaging is fully automated

100s of Millions/Year

Size

X

✓

Components are integrated into a single chip

Cost

X

✓

Everything is done at wafer-scale with semiconductor technology

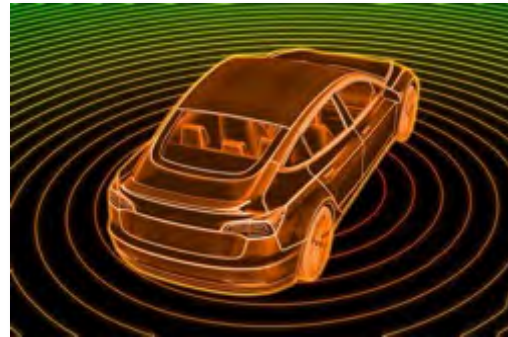
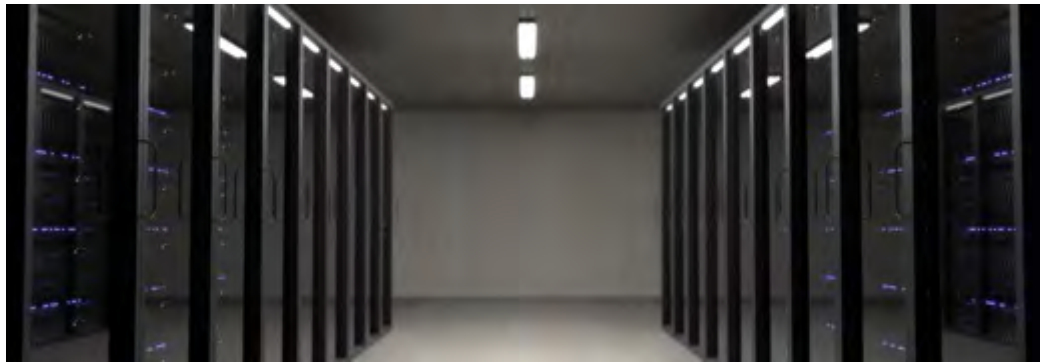
Power Consumption

X

✓

Components are fully integrated electrically and optically

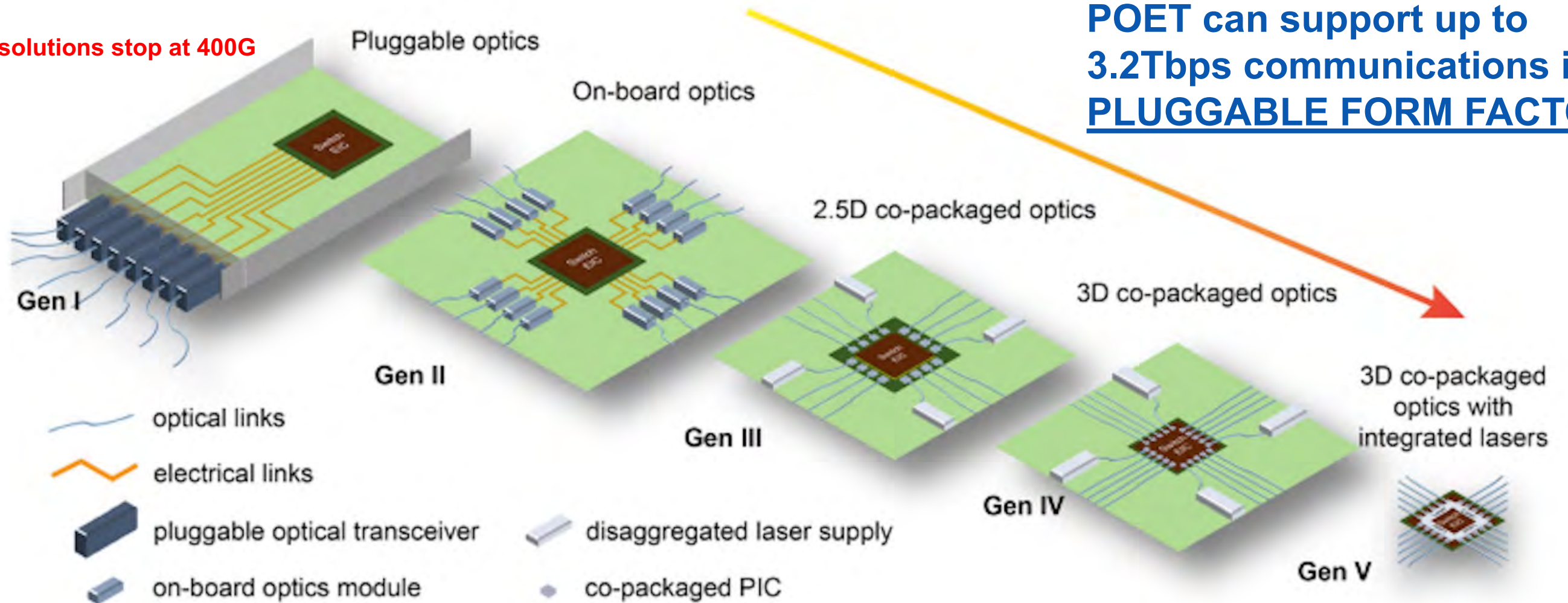
Billions/Year



The Data Communications Roadmap

Current solutions stop at 400G

POET can support up to 3.2Tbps communications in a PLUGGABLE FORM FACTOR

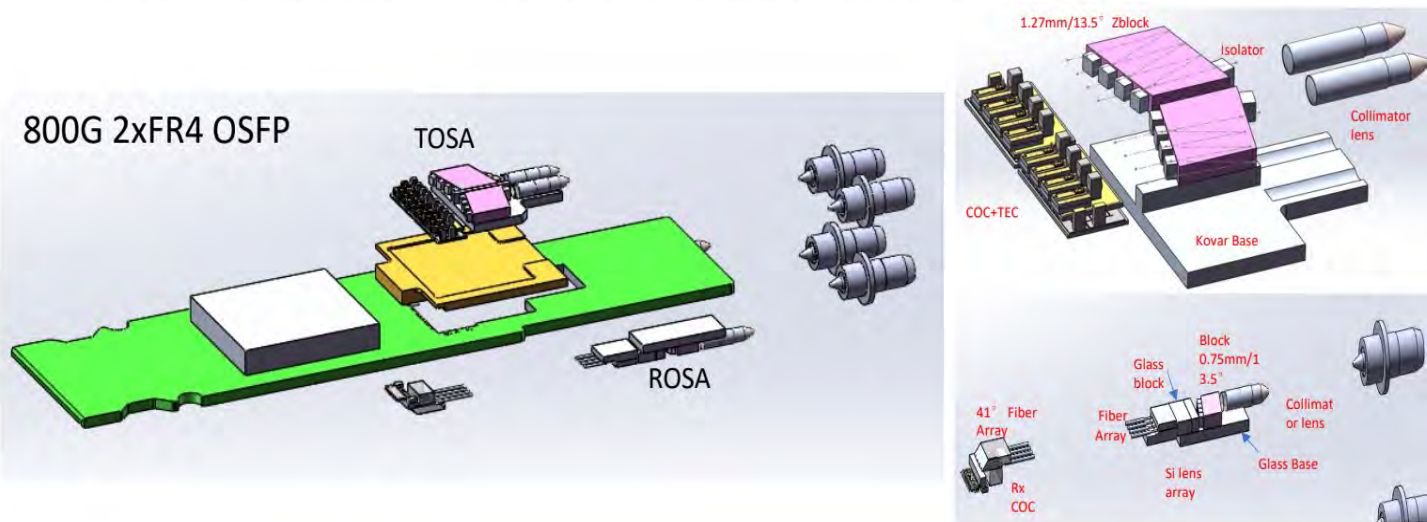


Challenges are acknowledged by some top module companies for 800G (2x 400FR4) and 1.6T (4x400GFR4) solutions

➤ Increasing Channel Counts Problematic



- As channel counts have increased, so has the complexity of the transmitter and receiver optical subassemblies (TROSAs).

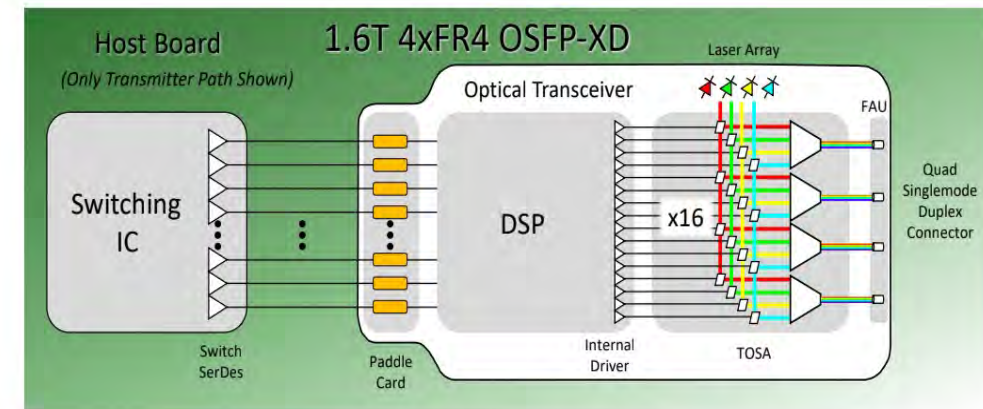


➤ We have reached the limits of discrete subassemblies... We need PICs.

➤ Optical Transceiver with PIC



- The PIC should replace the TOSA, ROSA, or both.
- The ideal solution would be just DSP+PIC on common substrate.



➤ The PIC should not add new burdens, like control ASICs, hermeticity, etc.

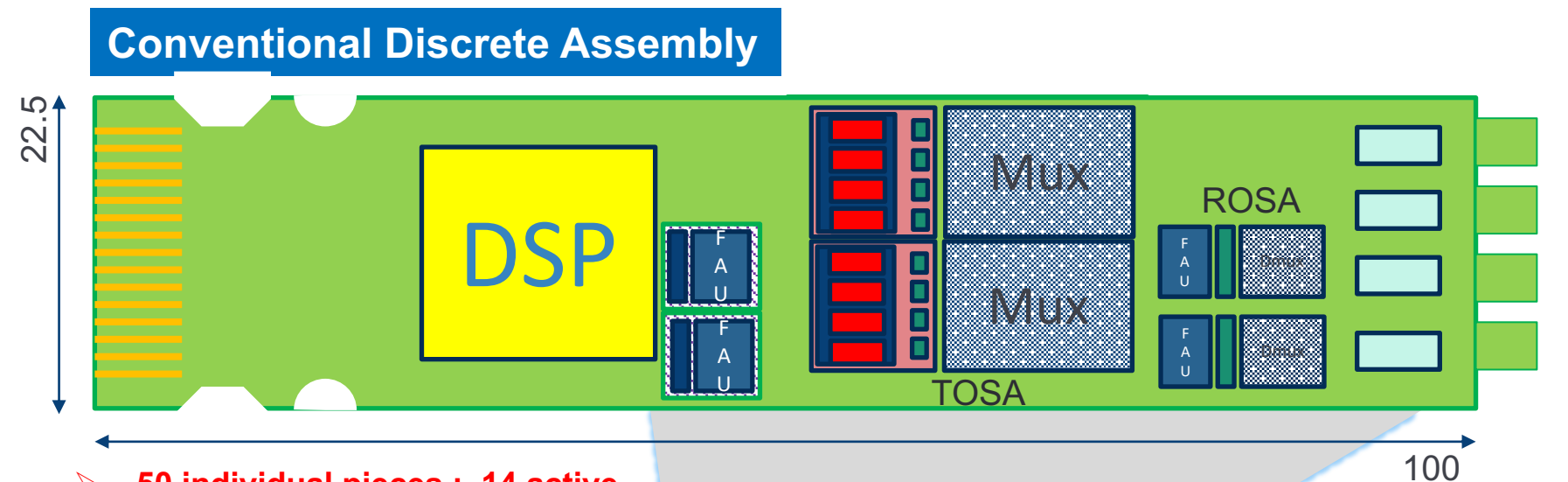
Presentation made at the Photonics Integrated Circuits Conference, Brussels, 2022

Simplified Design, Improved Energy and Lower Cost

Data Communications Challenges

- Serial data communication channels have not been able to keep up with the pace of bandwidth growth.
- Number of communications lanes increase as data rate increases!

Data Rate	Number of lanes
10G	1
40G	4
100G	1/4
200G	4
400G	4
800G	8
1.6T	8/16
3.2T	16



- 50 individual pieces ; 14 active alignments
- Unsustainable for 8 channels ; Impossible for 16

**POET :
75% smaller**

POET's Hybrid Integration



- 2 integrated Tx and Rx optical engines with no active alignment
- Readily scalable to 16 channels implementations

Key Competitive Differentiators

POET's Optical Interposer provides a comprehensive integration platform relative to incumbent competing technologies

Best in class integration of Tx and Rx: Small size, lower power and customizable design
Compared to other Silicon Photonic PIC vendors

Competition	Key competitors	Wafer scale Assembly scale and cost	Hybrid integration best of breed components	Form Factor small size & customizable
POET				
Conventional OSA Suppliers	Mitsubishi, Sumitomo, CIG, San-U, Tsuhan, Others			
Silicon Photonics	Intel, Marvell, Cisco, Others			
Vertically Integrated Module Makers	Innolight, II-VI, Others			

Discrete Component	Vendor A	Vendor B	Vendor C	Vendor D	POET OE
Modulator	✓ Modulator	✓ Modulator	✓ Modulator	✓ Modulator	✓ Modulator
Lasers	✓ Colored lasers		✓ Grey lasers	✓ Colored lasers	✓ Colored lasers
MUX	? MUX			✓ MUX	✓ Monolithically integrated MUX
Isolator					✓ None needed
DMUX					✓ Monolithically integrated DMUX
Photodiodes		✓ Photodiodes	✓ Photodiodes		✓ Photodiodes
TIA		✓ Flip-chip TIA			✓ Flip-chip TIA
FAU					✓ FAU

POET's Hybrid Integration Platform provides a COMPLETE solution for next generation Data Center Interconnects as well as other parallel market verticals

Strong Value Proposition at 400G and beyond

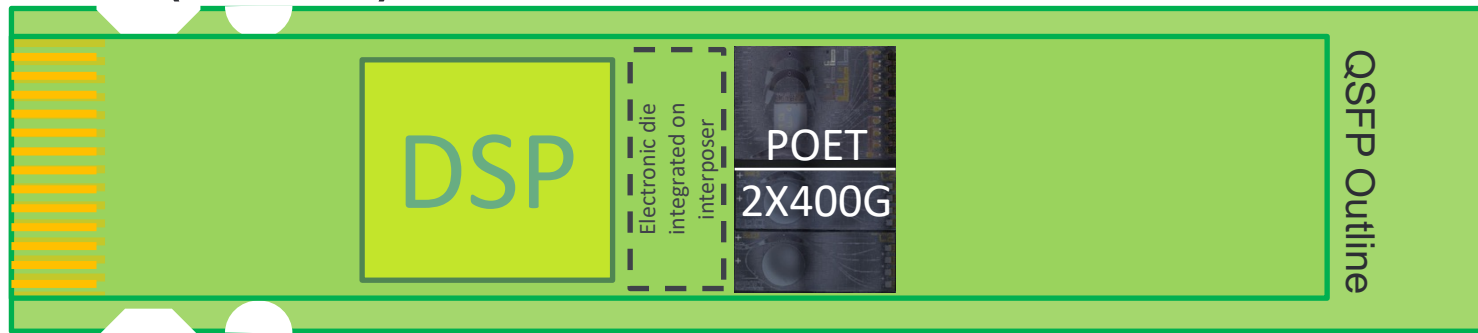
400G (1X400G) FR4

QSFP-DD



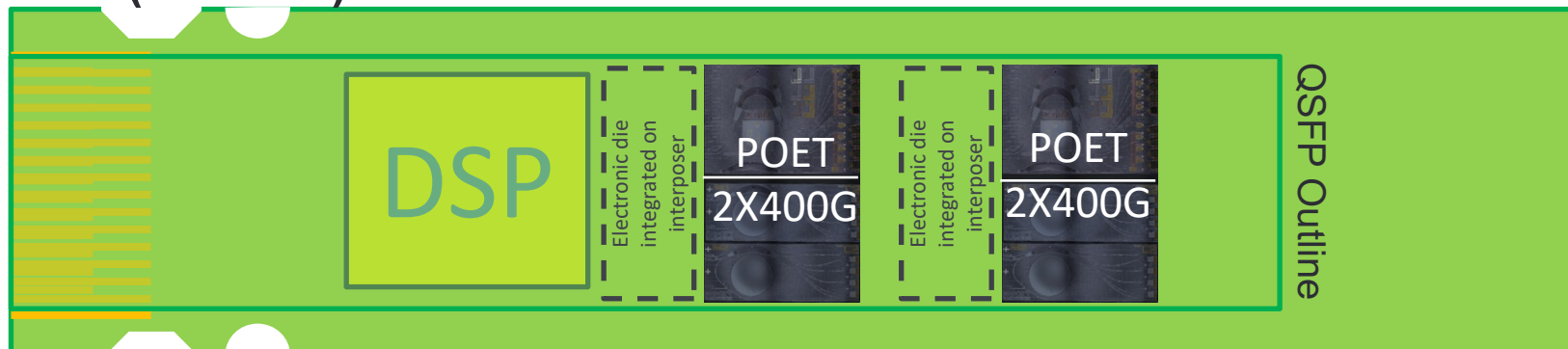
800G (2X400G) FR4

OSFP



1.6T (4X400G) FR4

OSFP-XD

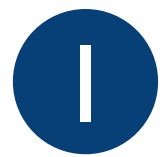


Leverage for 400G value engineering

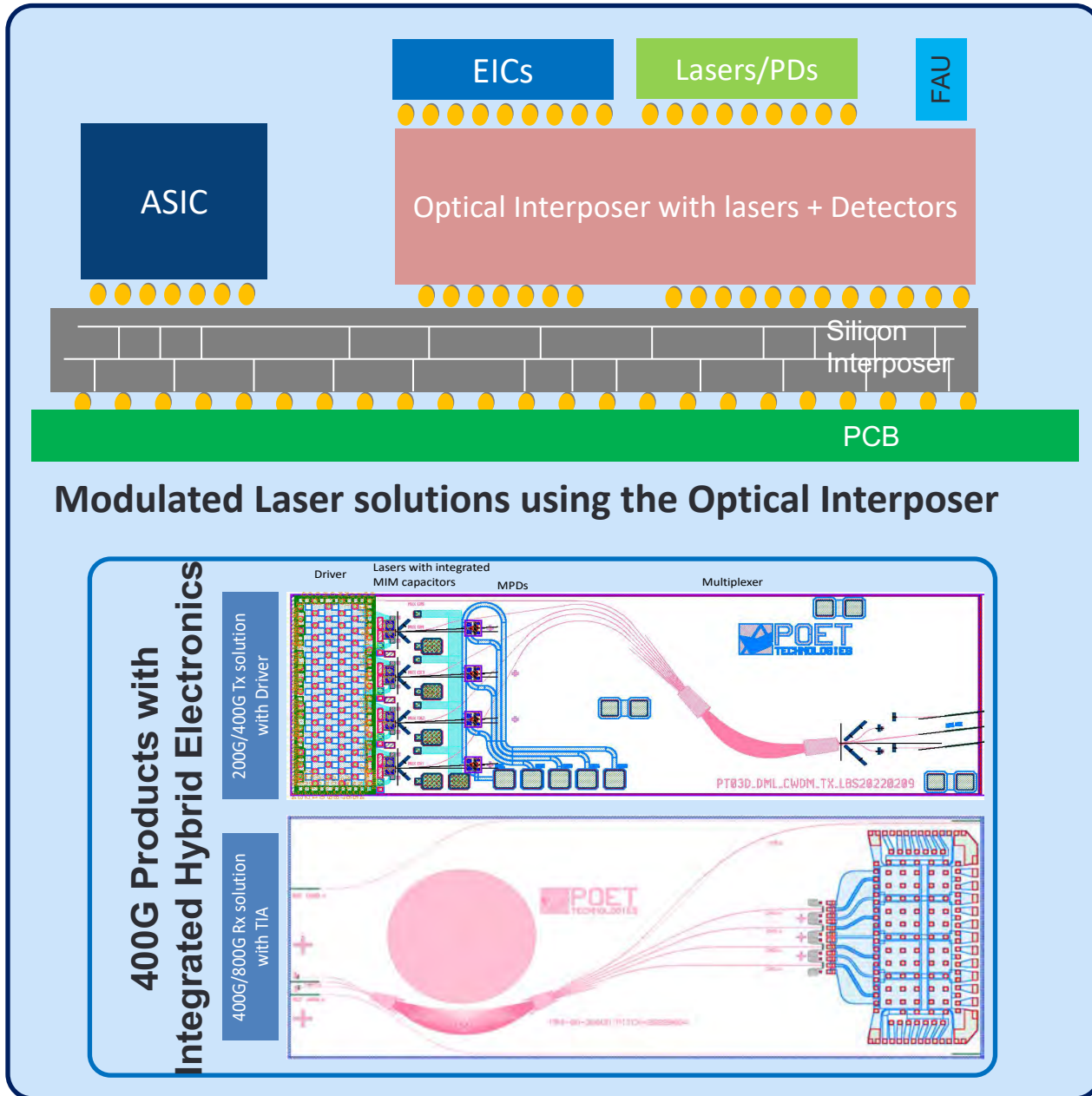
Onward roadmap to 1.6T/3.2T

Why 800G?

1. 800G (2X400G) is an inflection point for rapid growth in 800G by data centers.
2. Extends the preferred path for data centers with 1.6T, 3.2T pluggables and 6.4T chiplets for pluggables or Co-Packaged Optics *in multiplexed format*.
3. POET's technology surpasses all others at this node in terms of size, power requirements, cost and ability to scale.
 - Board design flexibility
 - Ease of thermal management
 - Manufacturability



Enabling THE solution for 800G to 3.2Tb pluggable modules



1

Bottom Access Electrical: Through Silicon Vias on the Interposer eliminates wirebonds, improves performance, lowers power consumption and enables compaction → Critical for any high density pluggable or co-packaged optics

The interposer pre-fetches this requirement with a foundry compatible Through Silicon Via process

2

Top Access Optical: Connectorized solution for fiber access on the Interposer eliminates ALL alignments and dramatically simplifies any optical module assembly

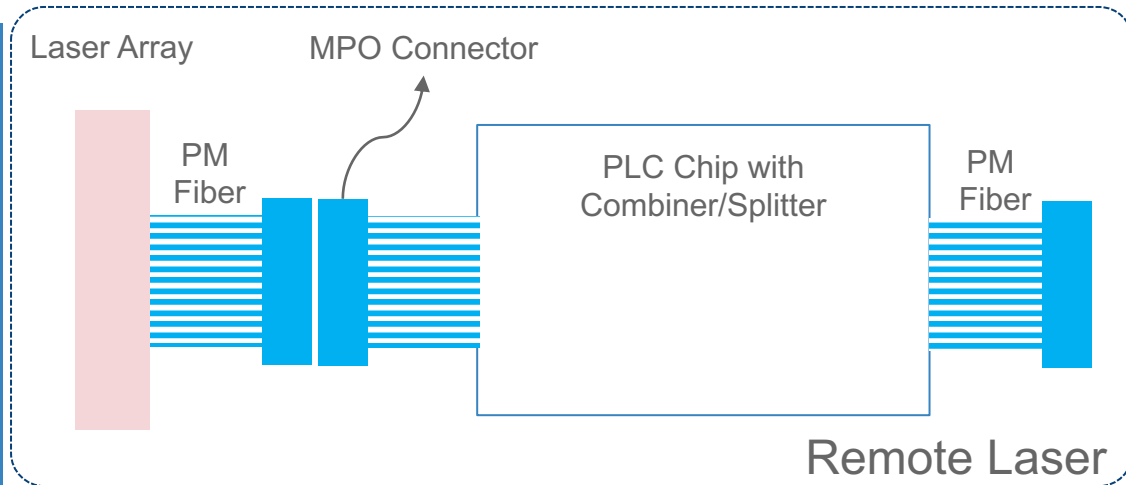
The interposer can provide a low loss top access port for top side optical access



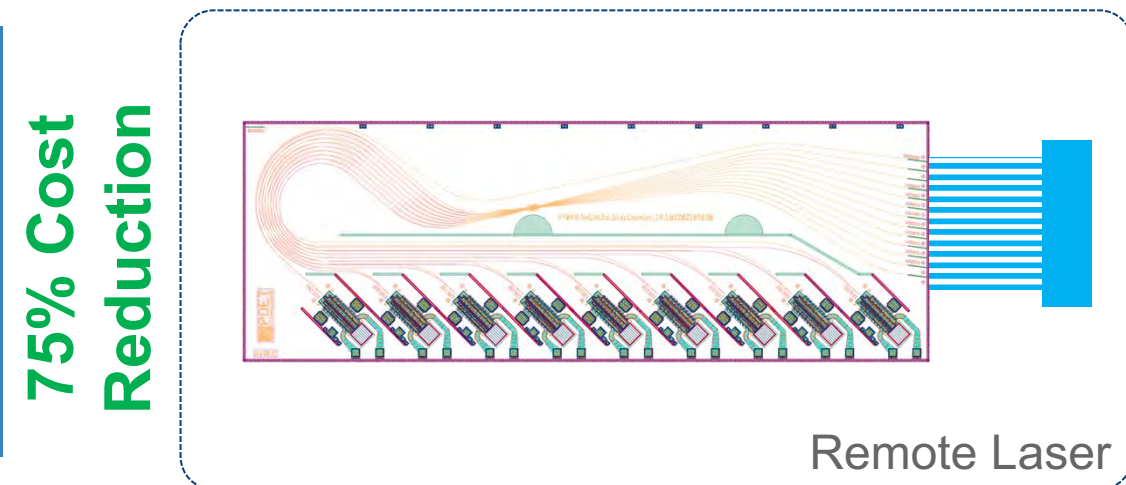
Optical Interposer Light Sources for High Bandwidth Communications

Engaged with leading AI-ML Accelerator and Chip-Chip communication companies to provide novel light sources at lower cost and greater flexibility than conventional laser suppliers.

Current Solution



POET Solution



- POET's Optical Interposer platform enables wafer scale, passive assembly of **high channel count lasers – with in-built splitting / multiplexed solutions as required**
- **Eliminates the requirements** for laser array use which are very expensive
- **Meets cost, form factor and SCALE requirements** for high volume applications
- **Optimized laser coupling efficiency** and power
- **Ability to integrate micro-optics** at wafer scale and passively
- Chip-on-board construction ; **Eliminate expensive PM cables otherwise required**



Optical Interposers for Integrating New Materials

Monolithic Integration

Deposited or Grown on the wafer

- Best Cost Option Potential
- Complex Performance tradeoffs
- Limited Materials Choice
- Mature for some platform materials (eg. SiN)

Hybrid Integration

Assembled on to target as finished components

- High Flexibility
- Wafer Scale Assembly Techniques with pick and place
- Known Good Die
- Great option for limited numbers of components
- Limited Performance Tradeoffs
- Packaging Simplicity
- Best components for the application

Heterogenous Integration

Transferred / Bonded on the wafer

- High Material Integration flexibility
- Best Material for the application
- Low Cost Potential
- Emerging Technology

Lithium Niobate has advantages but lacks Integration Capability

More Bandwidth

(internet bandwidth grows by 100X in the next decade)

More compact and faster EO Modulators

EO Light control below 1um wavelength

(In wavelength range that Silicon or InP are not transparent)

Wide Transparency Window

Integration and Scalability

(The magic of the Interposer is the miniaturization of optics)

Extend Capability without giving up integration and scalability using a Heterogenous Interposer

Power Consumption

(Data Centers consume increasingly large percent of energy)

Efficient and Low Loss EO Modulators

Non Linear Photonics and Metrology

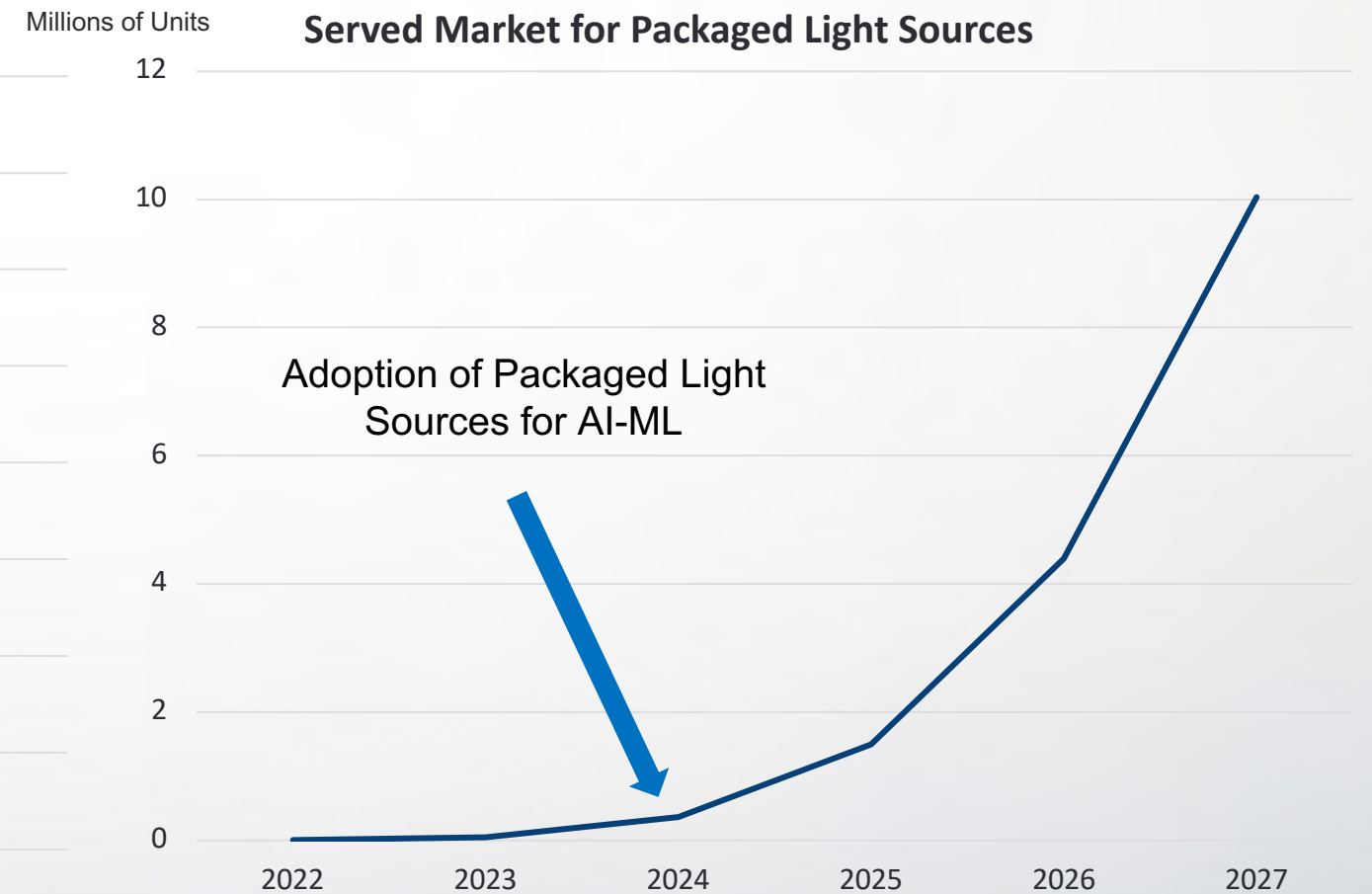
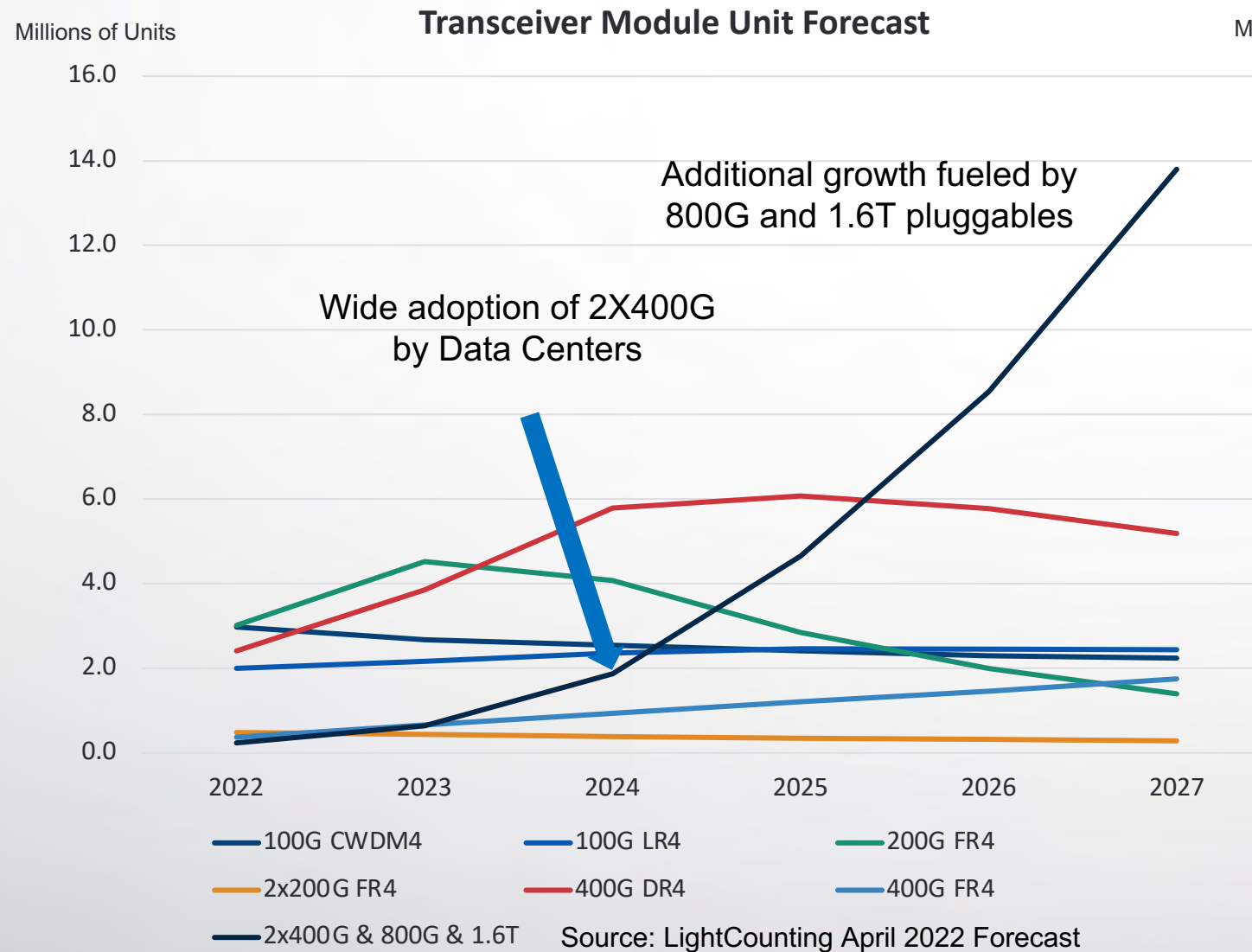
(Wavelength conversion, 2nd harmonic generation, optical frequency combs)

Large $\chi^{(2)}$ and $\chi^{(3)}$ Optical Non Linearity

An **Optical Interposer** breathes integration potential to novel materials which otherwise might have challenges integrating to the tight form factors required for next generation modules

Aiming at Two Key Market Inflection Points

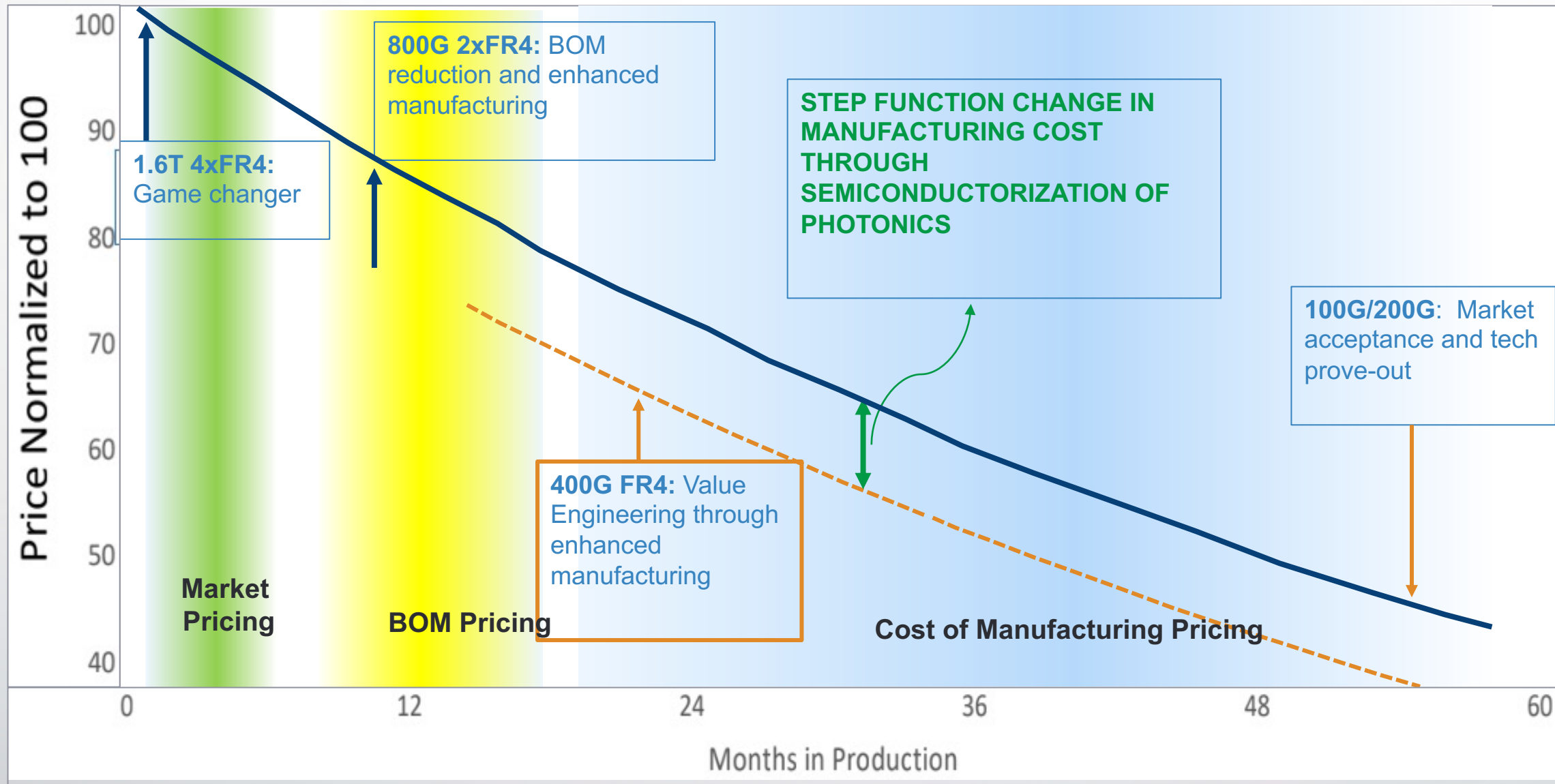
Two key market inflection points represent major growth opportunities, both playing to POET's strengths and driven by customers.



Source: Internal Estimates based on customer projections

Go-to-Market Plan

POET's "Go-To-Market" Plan leverages its advantages in BOM Pricing as well as its lower Cost to Manufacture

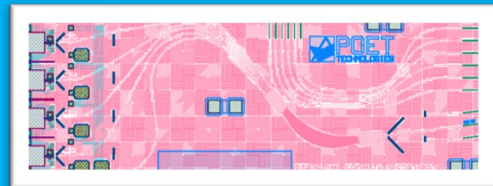


Manufacturing Value Add through POET's Interposer Platform

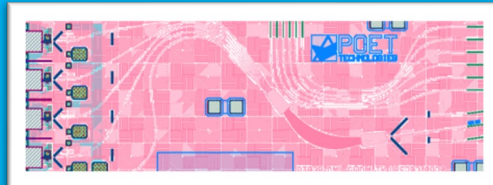
- ▣ Wafer Scale Assembly and Test
- ▣ No active alignments for components or micro optics
- ▣ Fiber attach capability with low loss
- ▣ Eliminating wirebonds through SMT attach to PCB
- ▣ Complete solution with Integrated Electronics

Go-to-Market Plan

NOW SAMPLING AND SELLING TO MODULE CUSTOMERS



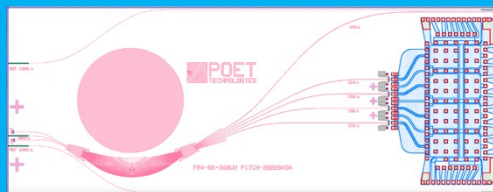
100G CWDM4
100G LR4 OE



200G FR4
OE

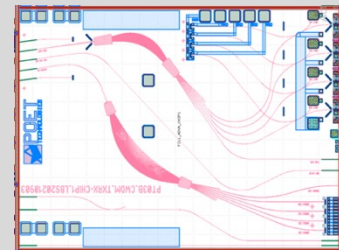


200G FR4 TX w Driver and Rx with TIA

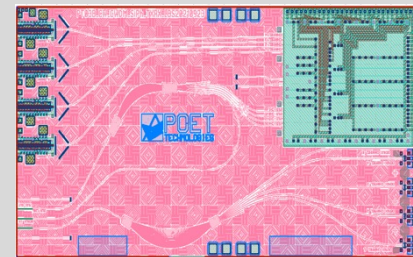


400G FR4
RX OE

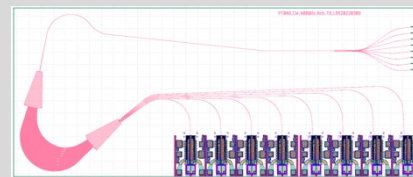
IN DEVELOPMENT - SAMPLES IN 1H 2023
RELEASE TO PRODUCTION AND SALE IN 2H 2023



400G FR4 OE
with DMLs no Ext. Modulator

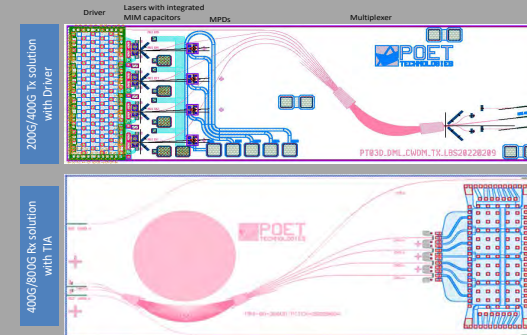


400G FR4 OE
CW with SiPh Modulator



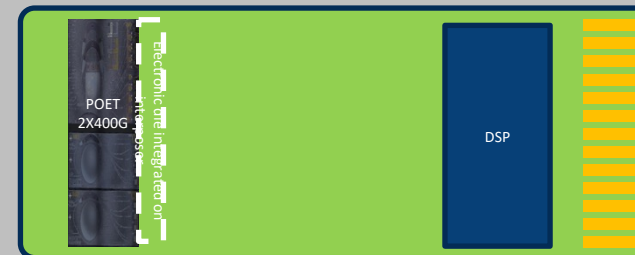
Packaged Light Sources for
Celestial AI and Others

RELEASE TO PRODUCTION AND SALE IN 1H 2023



400G FR4 TX OE with Driver
400G FR4 RX OE with TIA

RELEASE TO PRODUCTION AND SALE IN 2H 2023

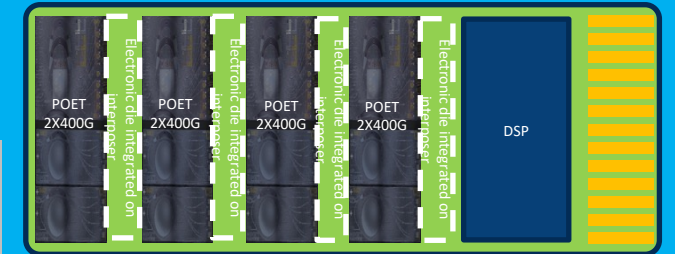


800G (2X400G) FR4 AND
400G MODULES

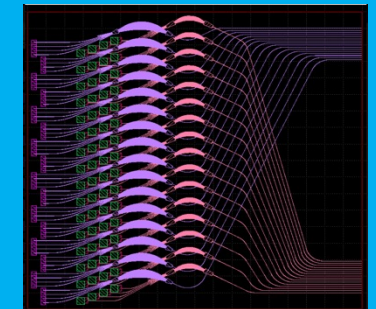
2024-2026



1.6T (4X400G) FR4
MODULE



3.2T (4X400G) 200G/I FR4
MODULE



6.4T 16 LANE DUAL WAVEGUIDE
CPO MODULE

Long-Term Financial Model

- POET is positioned to achieve significant operating leverage driven from its revenue ramp
- Over the longer-term, POET expects to achieve 50%+ gross margins and 25%+ EBITDA margins

	<u>Near-Term</u>	<u>Mid-Term</u>	<u>Long-Term</u>
Revenue Scenarios <i>(\$ millions)</i>	\$20	\$100	\$250
<i>Gross Margin %</i>	40%	45%	50%
<i>R&D % of Sales</i>	40%	10%	7%
EBITDA	(Negative)	Mid-teen %	25+%

- JV financials are not consolidated into POET financials

Illustrative examples, above figures are not representative of management projections or estimates

Key Metrics

Balance Sheet Snapshot

US\$ in Millions

Total Cash (as of June 30, 2022) \$13.8

Cash & Equivalents \$11.4

Short term Investments \$2.4

Total Debt (as of June 30, 2022) \$0.0

Monthly Cash Burn ~\$1.25

Capitalization Snapshot

*Weighted Ave.
Exercise Price*

Common Shares Outstanding 36,692,815

Warrants Outstanding 2,971,353

 Debenture Warrants 1,100,750 \$3.75

 Broker Warrants 195,883 \$6.38

 Offering Warrants 1,764,720 \$8.63

Management Options Outstanding 4,983,180

 Tranche 1 3,587,116 \$2.98

 Tranche 2 1,396,064 \$7.51

Fully Diluted Shares 44,647,348

 Treasury Method 42,180,730

AGENDA

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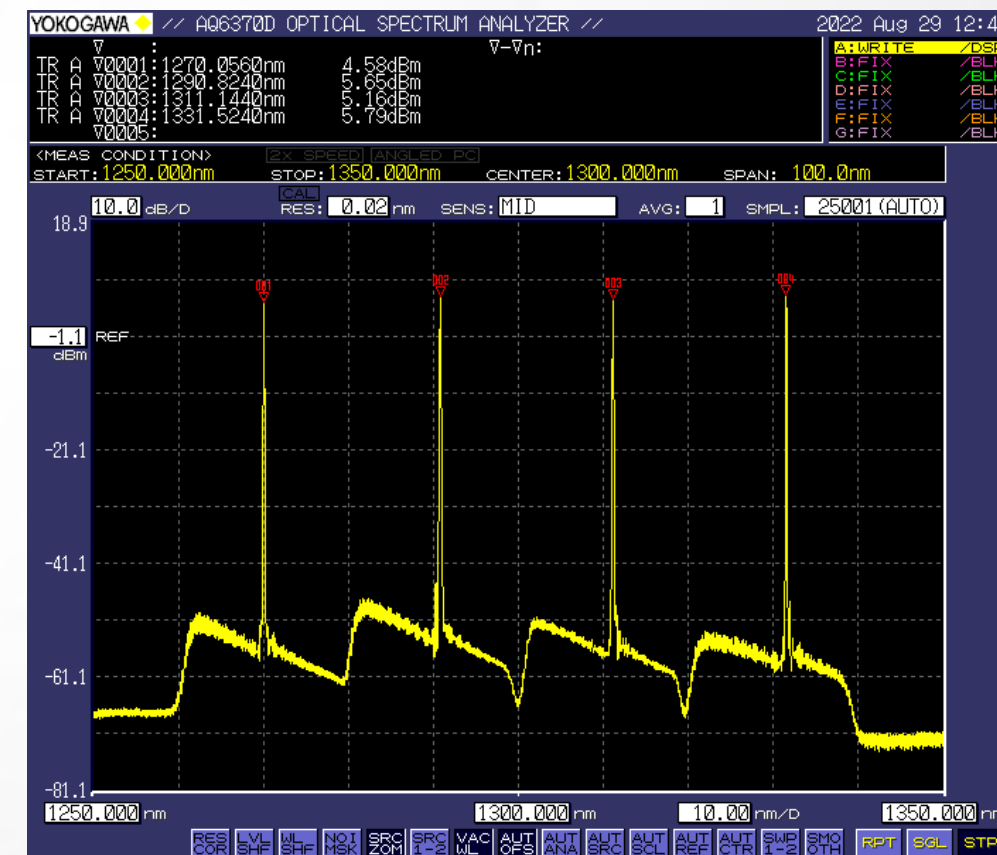
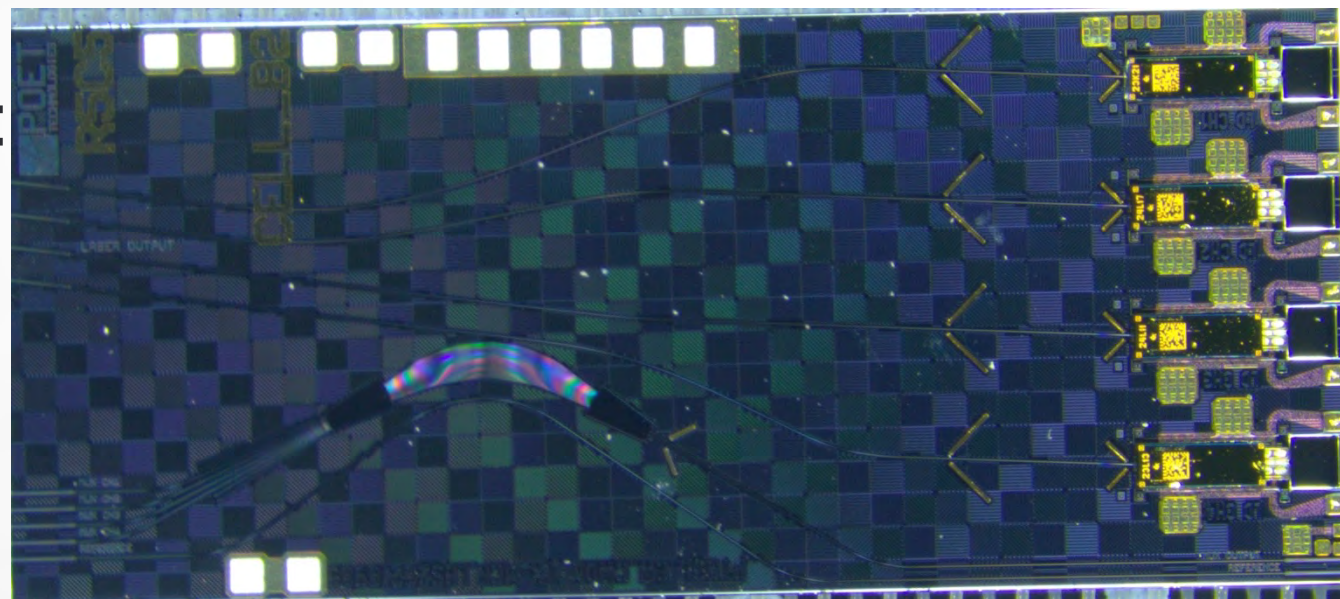


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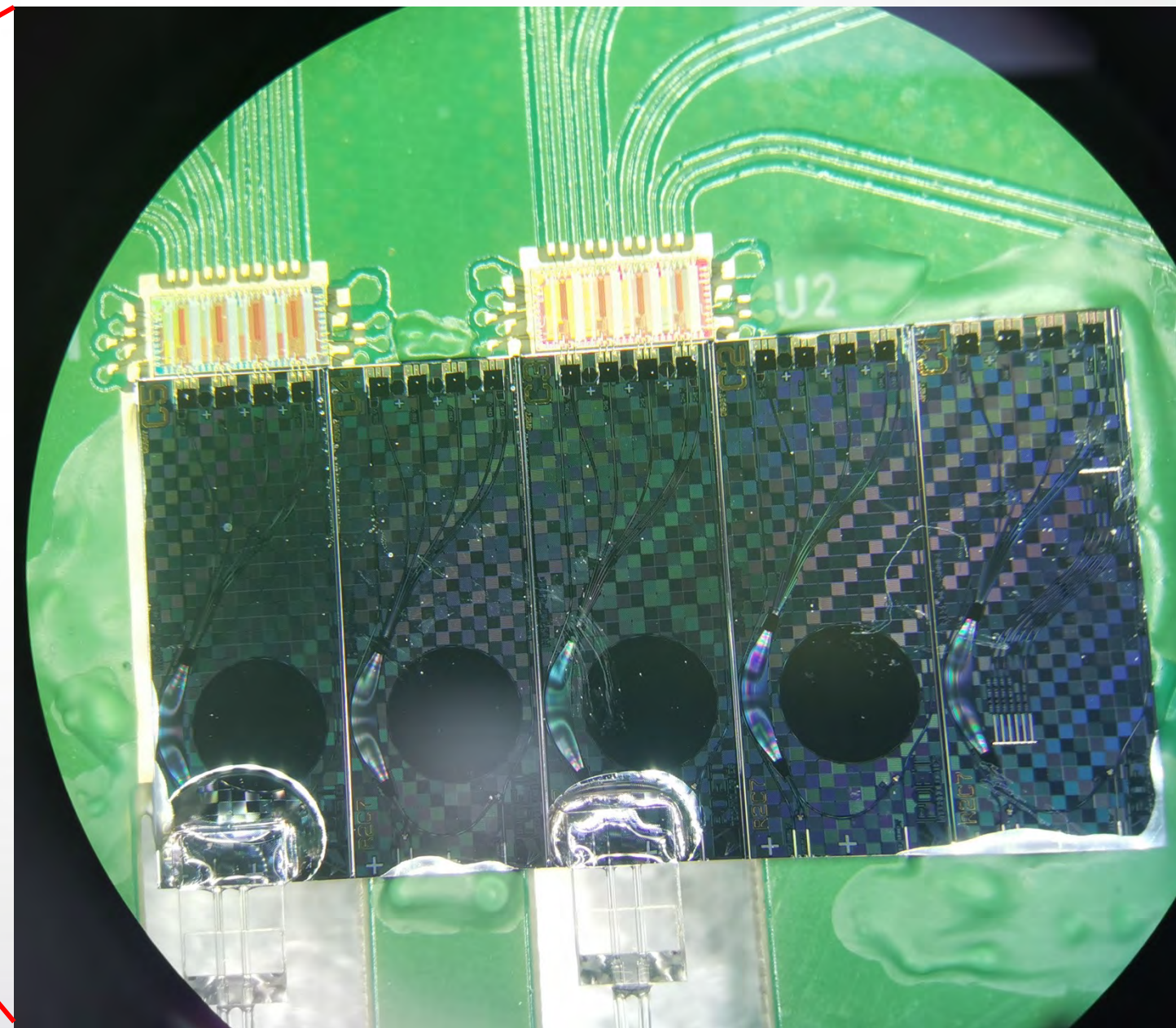
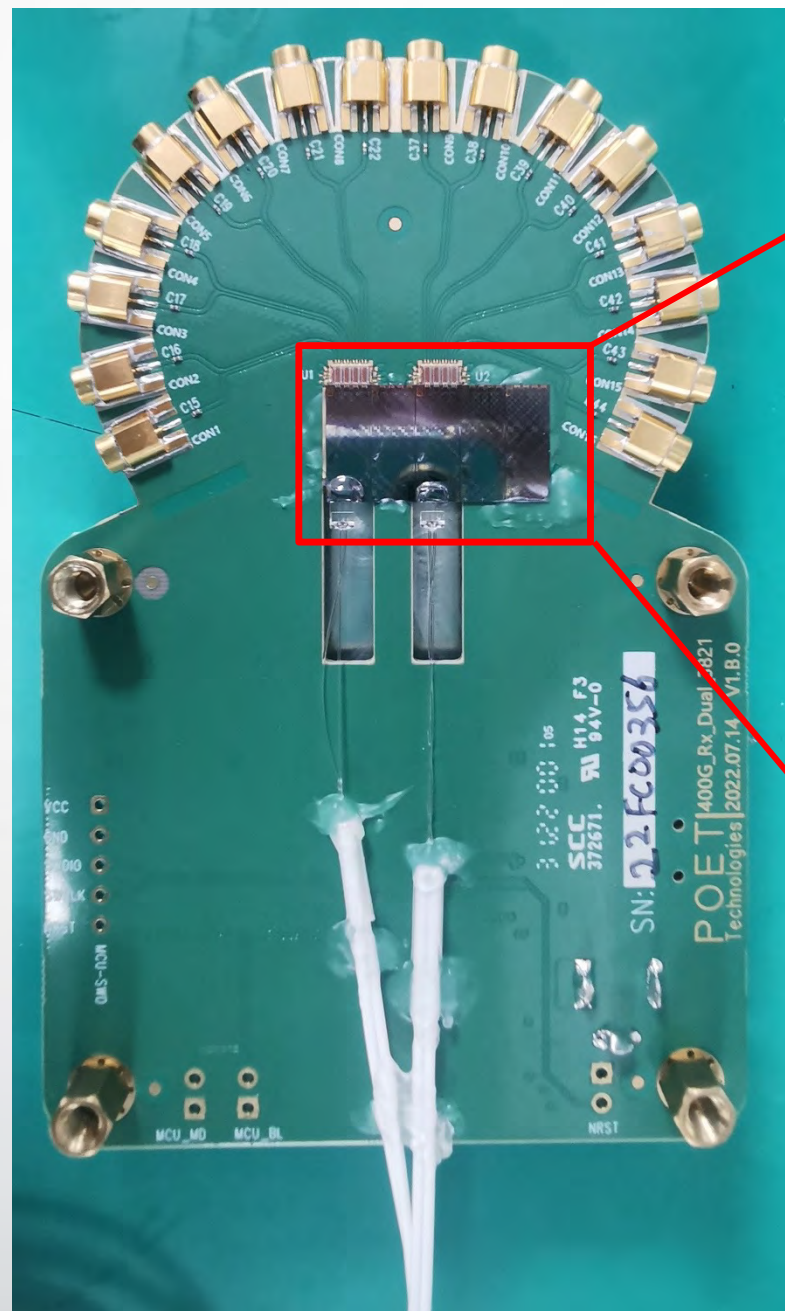
Live Demo #1: 400G Tx OE: LightBar + Modulator

LightBar:



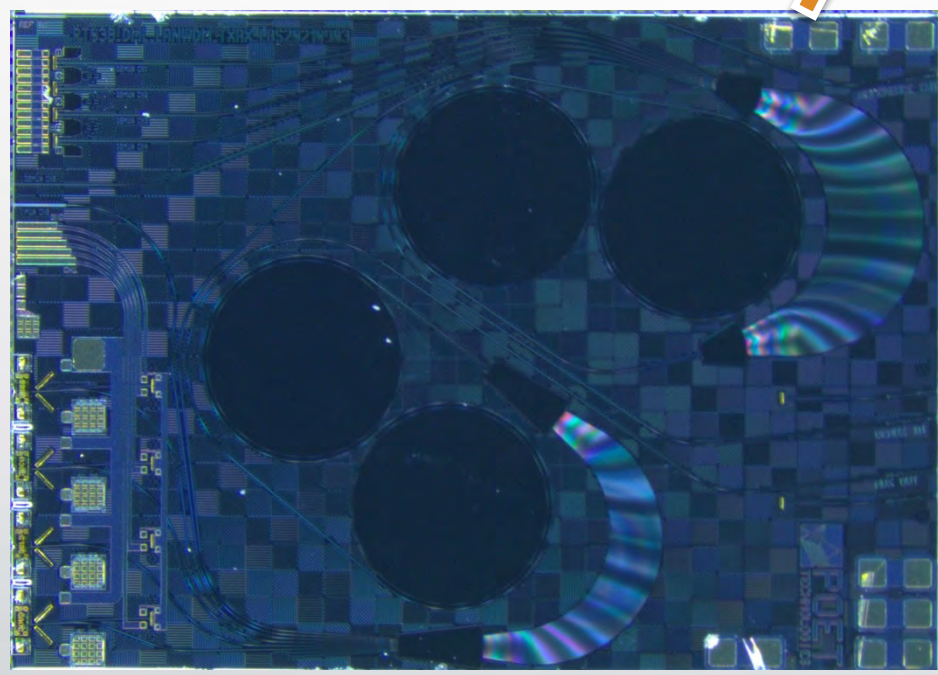
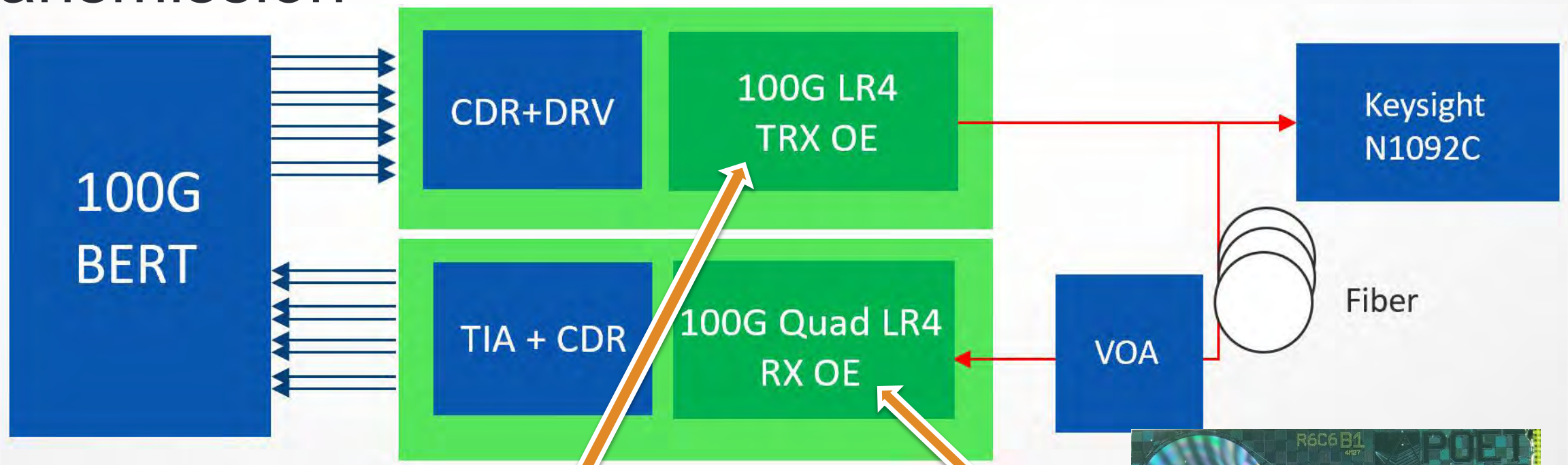


Live Demo #2: 1.6T (4x400G) Rx OE





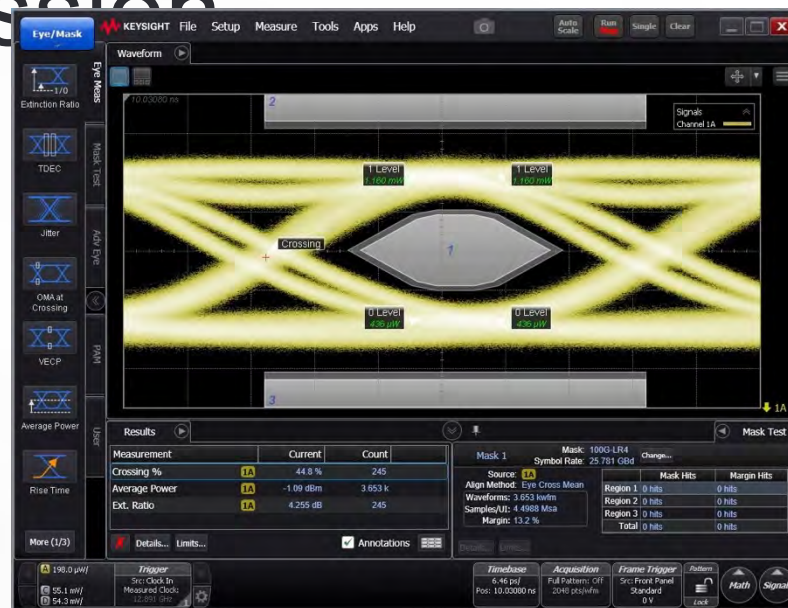
Live Demo #3: 100G LR4 Tx + Qual LR4 Rx with 10km Transmission



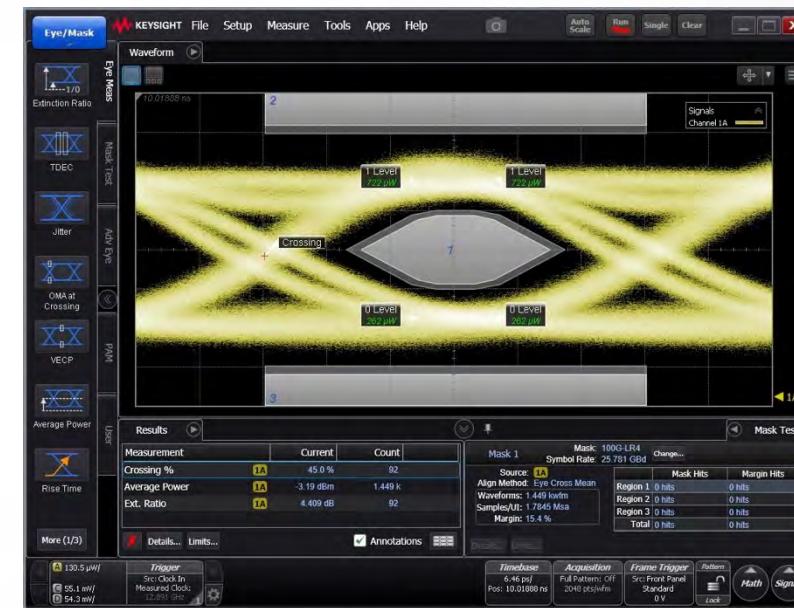


Live Demo #3: 100G LR4 Tx + Qual LR4 Rx with 10km Transmission

Tx at 45C with all 4-channel ON



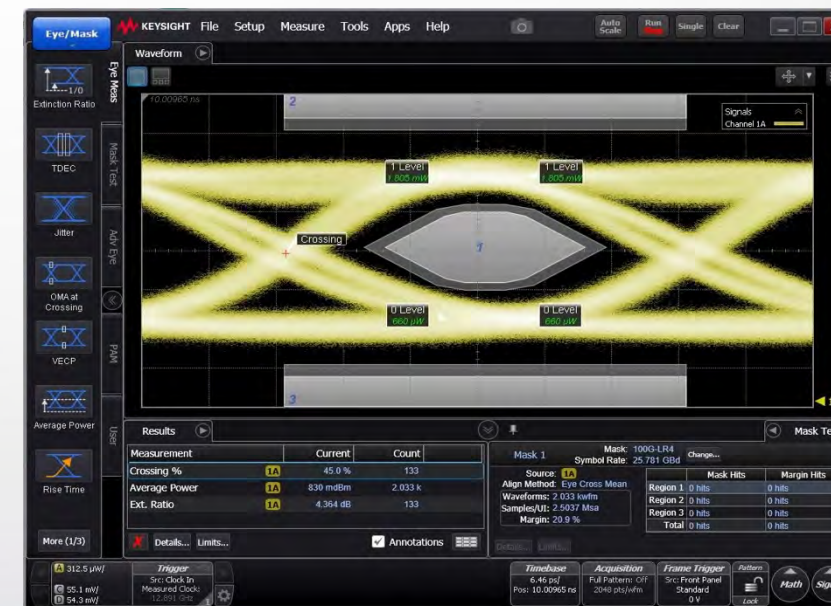
CH1 ER=4.25dB, EMM=13.2%



CH2 ER=4.4dB, EMM=15.4%



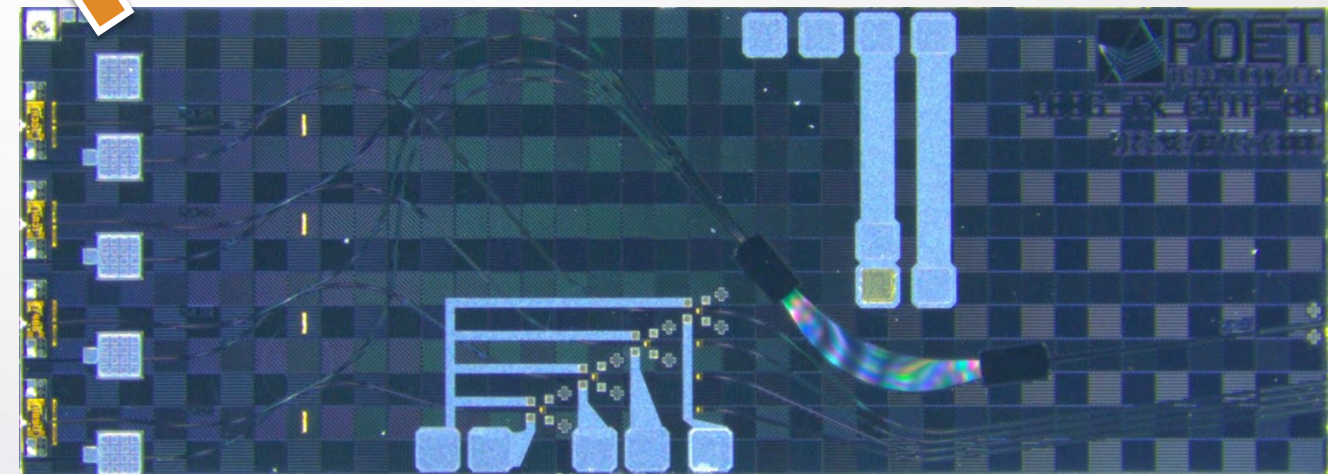
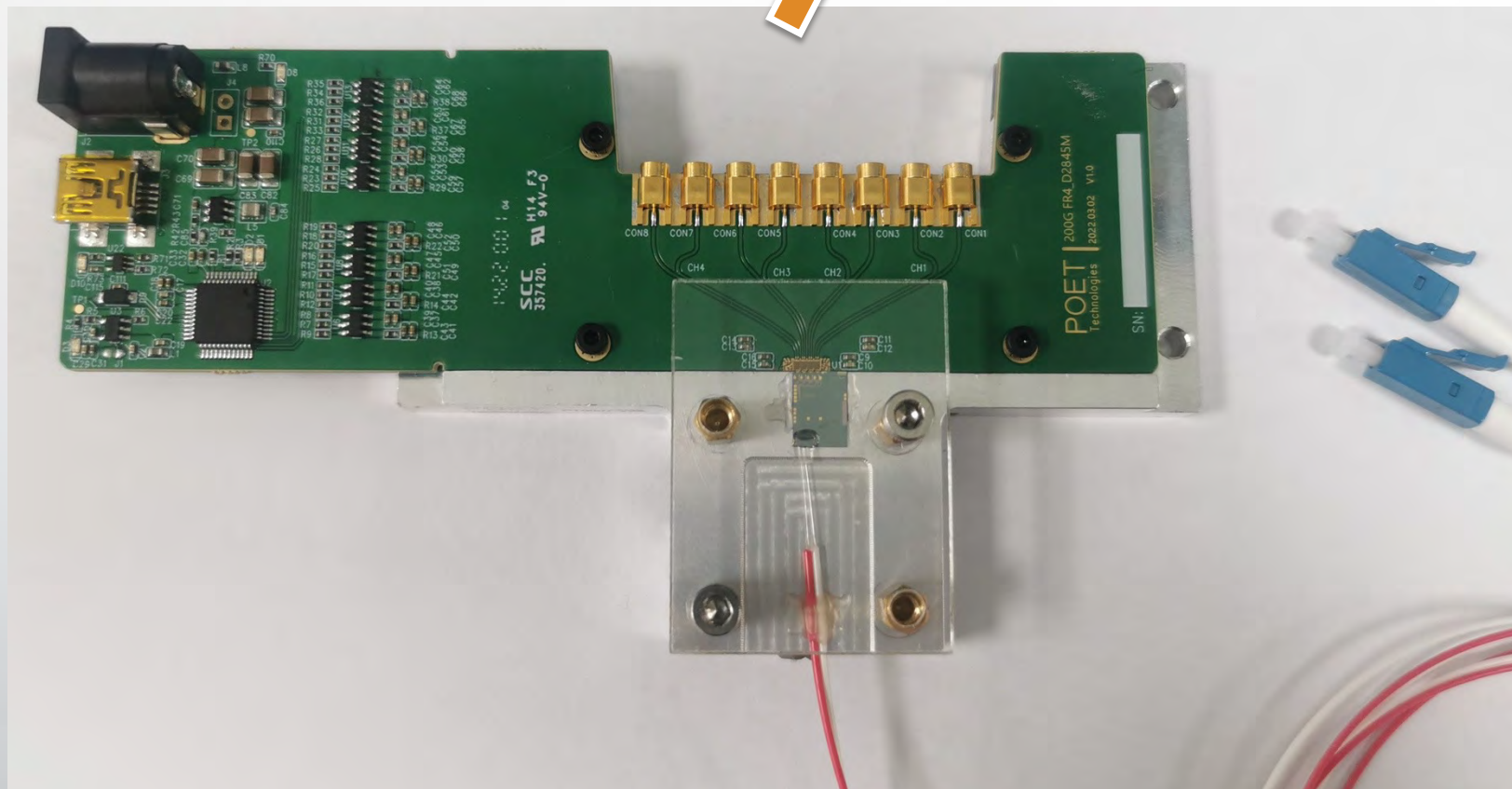
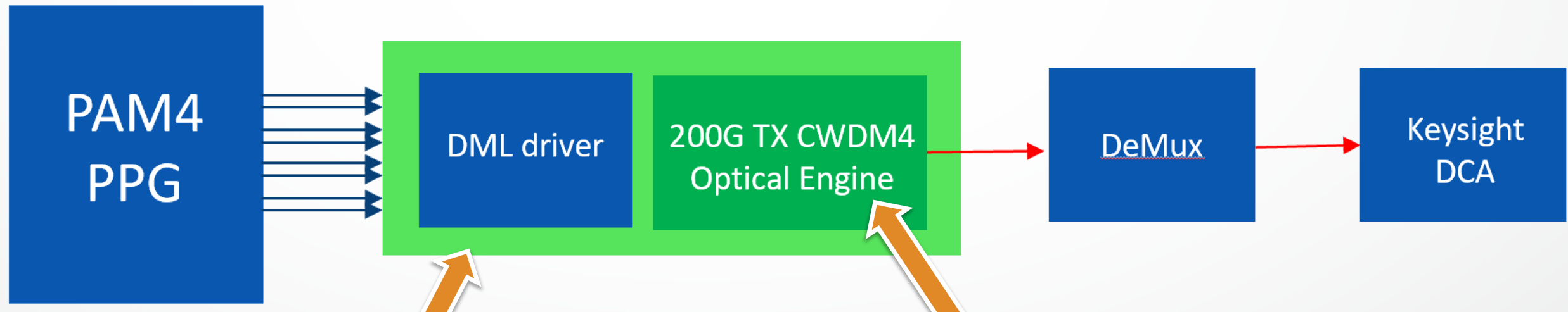
CH3 ER=4.23dB, EMM=21.4%



CH4 ER=4.36dB, EMM=20.9%



Live Demo #4: 200G FR4 Tx (@70C)





T e c h n o l o g i e s