



POET Technologies Inc.

PTK:TSXV

POETF:OTCQX

Investor Deck - Q4 2021

 Photonics and Technology Overview

 Markets and Potentials

 Products and Roadmap

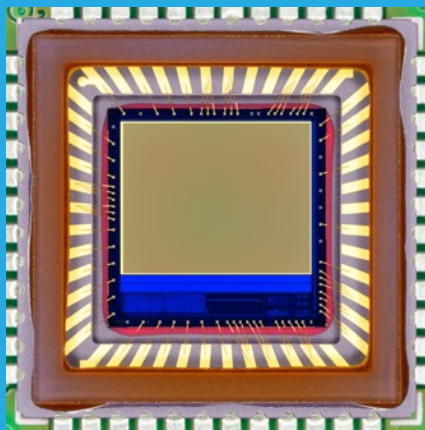
 Customer Engagement

 Operations, Strategy and Capital

Photonics Enables Many New Products

Photonics is the technology of generating and harnessing light

- ▶ Cutting-edge uses of lasers, optics, fiber-optics, and electro-optical devices in numerous and diverse fields
- ▶ Photonics applications and devices require the integration of electronic, photonic and optical devices



Photonics

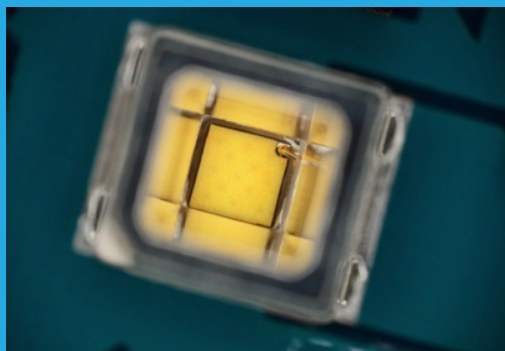
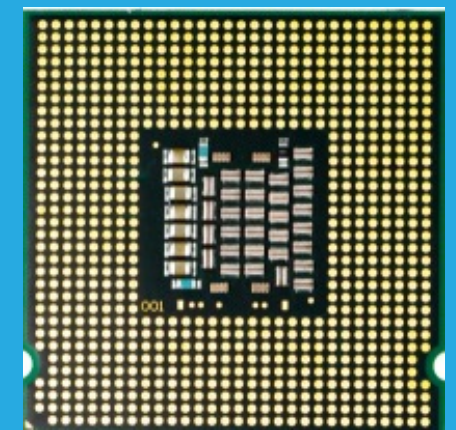
- Lasers
- Detectors
- Modulators
- Multiplexers
- De-multiplexers
- Mode Converters

Electronics

- Controllers
- Amplifiers
- ASIC's
- Monitors
- Microprocessors
- Memory

Optics

- Mirrors
- Lenses
- Prisms
- Collimators
- Polarizers
- Beam Splitters



POET is focused on a market with high potential for disruption and growth

Data and Tele-Communications



Data Centers
Switching / 5G Networks



- **Large Market:**
>\$3B market growing to >\$6B by 2025
- **High Volume:**
Products made to known industry standards
- **Sales:**
Competition is based on performance and price
- **Industry Trends:**
To less than \$1.00/GB cost of transceivers

Opportunity:

Lack of a method to fully integrate electronic, photonic and optical devices in the same package after 20+ years of trying

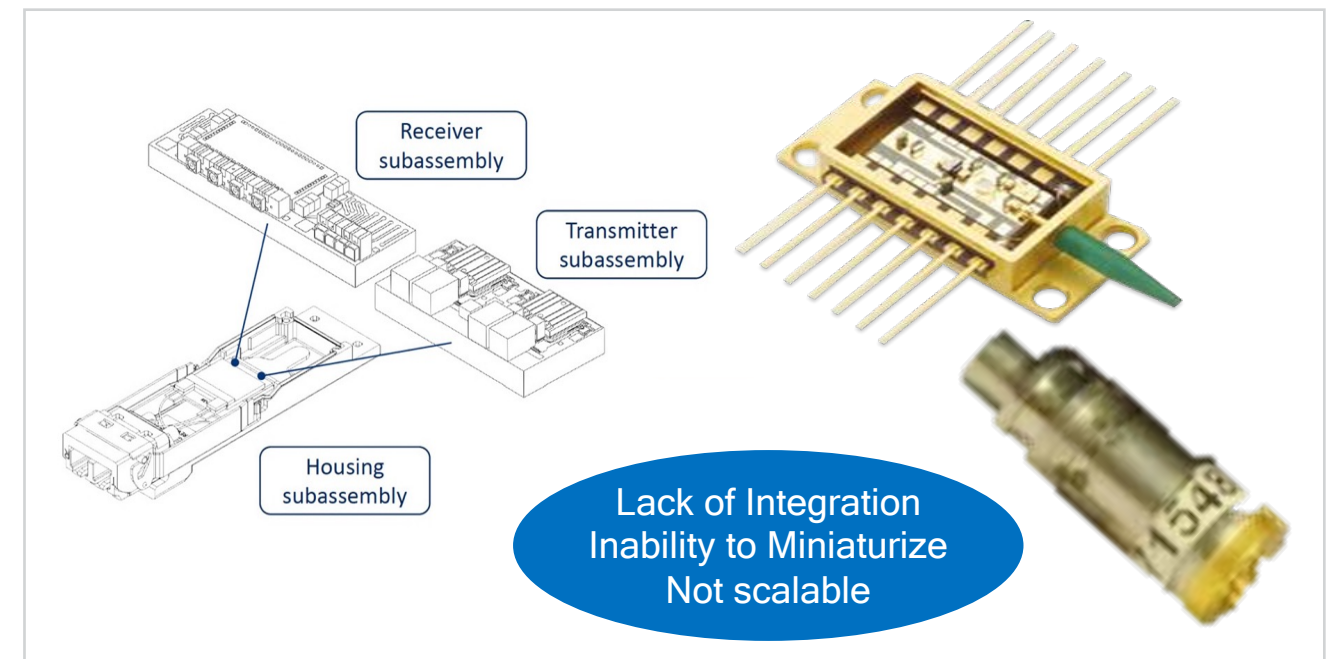
Conventional Assembly of Transceivers Not Sustainable

- ❖ Assemble multiple components and sub-assemblies one at a time - align and optimize signal (“active alignment”) with each component and sub-assembly placement
- ❖ No Economies of Scale - linear (1 to 1) relationship between unit output and capital invested
- ❖ Massive market demand is currently unmet by existing technology

Existing Sub-Assembly Operations are Capital and Labor Intensive



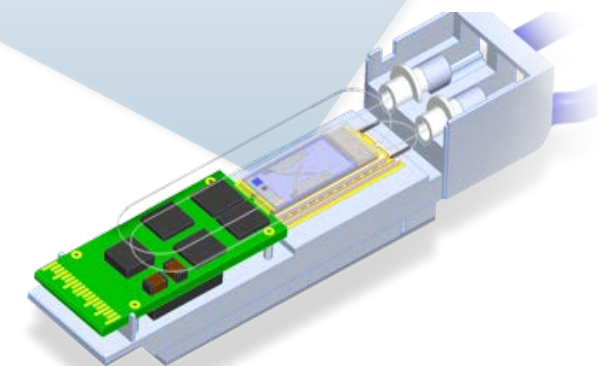
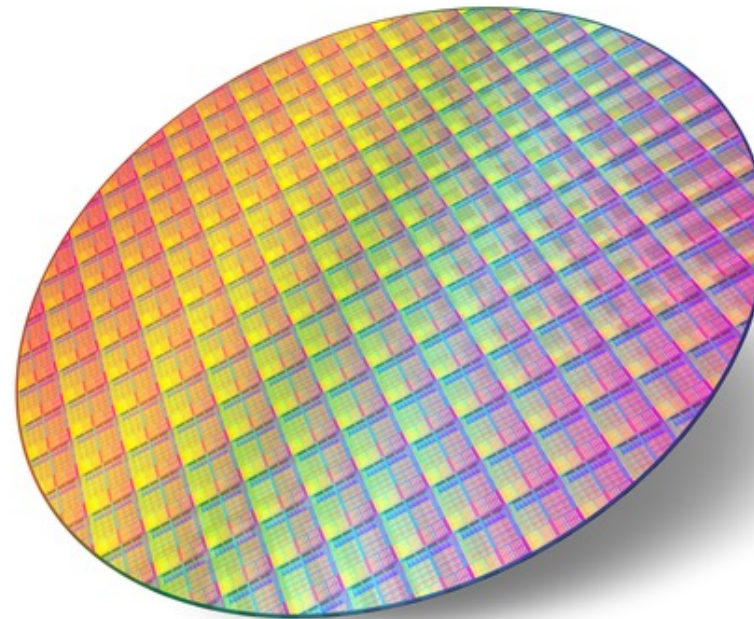
Existing Solutions utilize a large # of Components and Sub-assemblies



- Full integration of multiple active components with passive alignment at wafer scale using semiconductor assembly techniques
- Large Economies of Scale - non-linear (> 1 to 1) relationship between unit output and capital invested

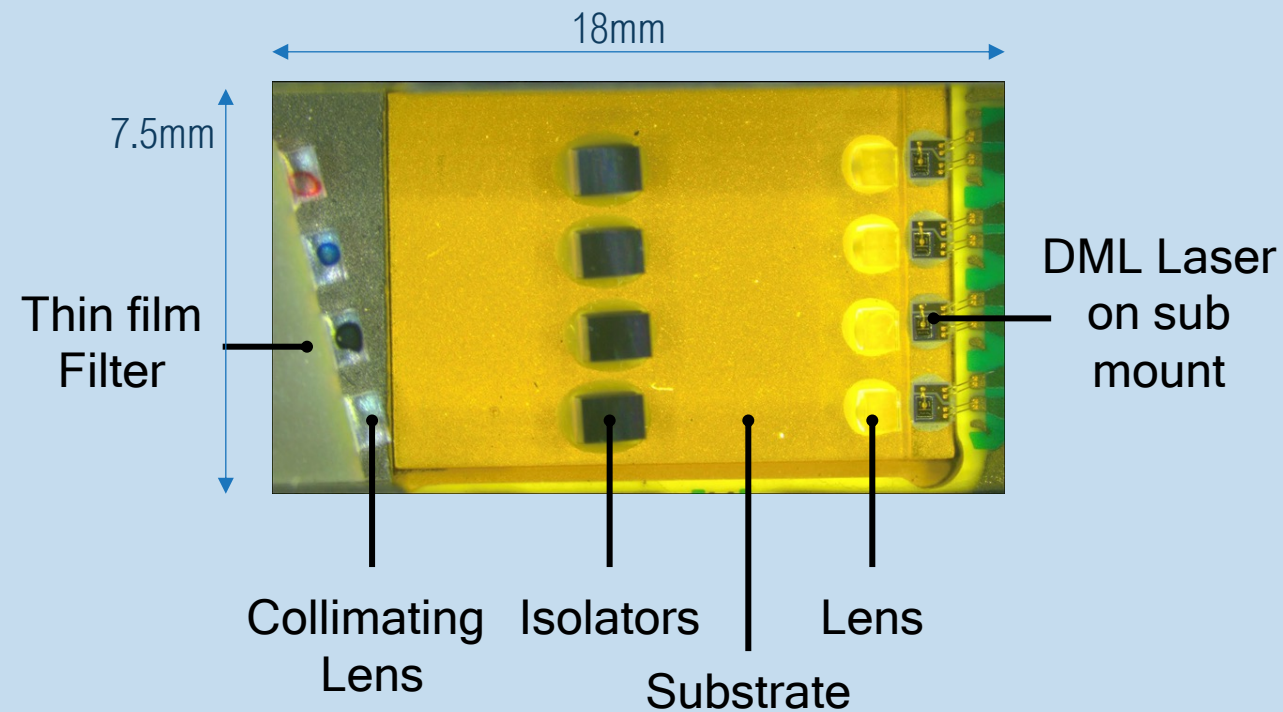
How POET Wins

- ✓ Simplified Packaging
- ✓ Lower Bill of Materials (BOM) Cost
- ✓ Highly Automated Wafer Scale Manufacturing
- ✓ Dense, Smallest Form Factor
- ✓ Excellent Electrical and Optical Performance



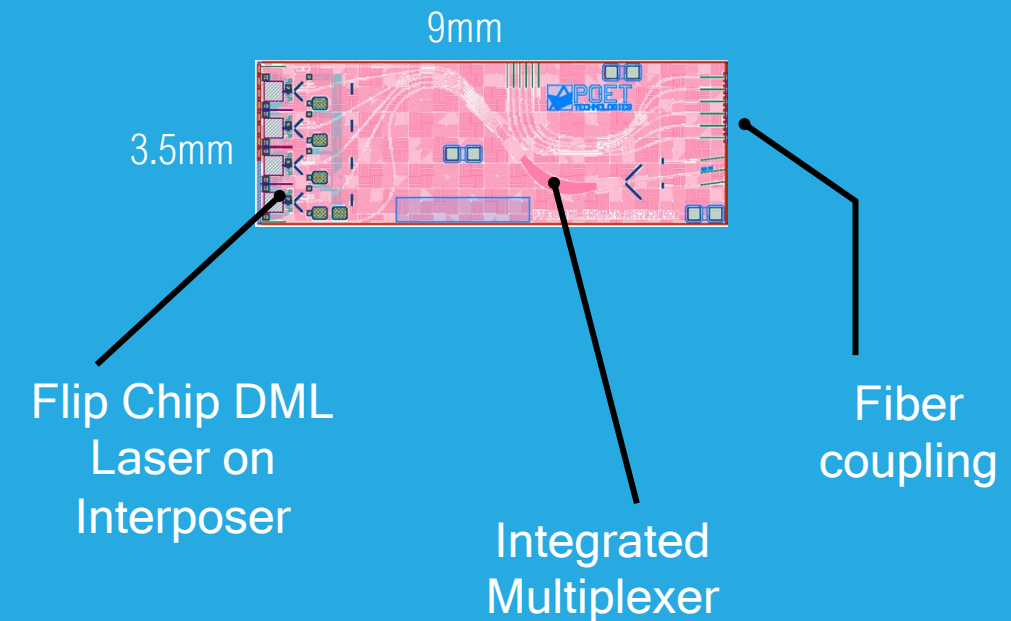
Producing the World's Smallest and Lowest Cost 100G/200G Optical Engine including all Active and Passive Photonics Devices

Conventional Chip on Board



- Bill of materials : 30 separate pieces including carriers
- Active Alignment : 8

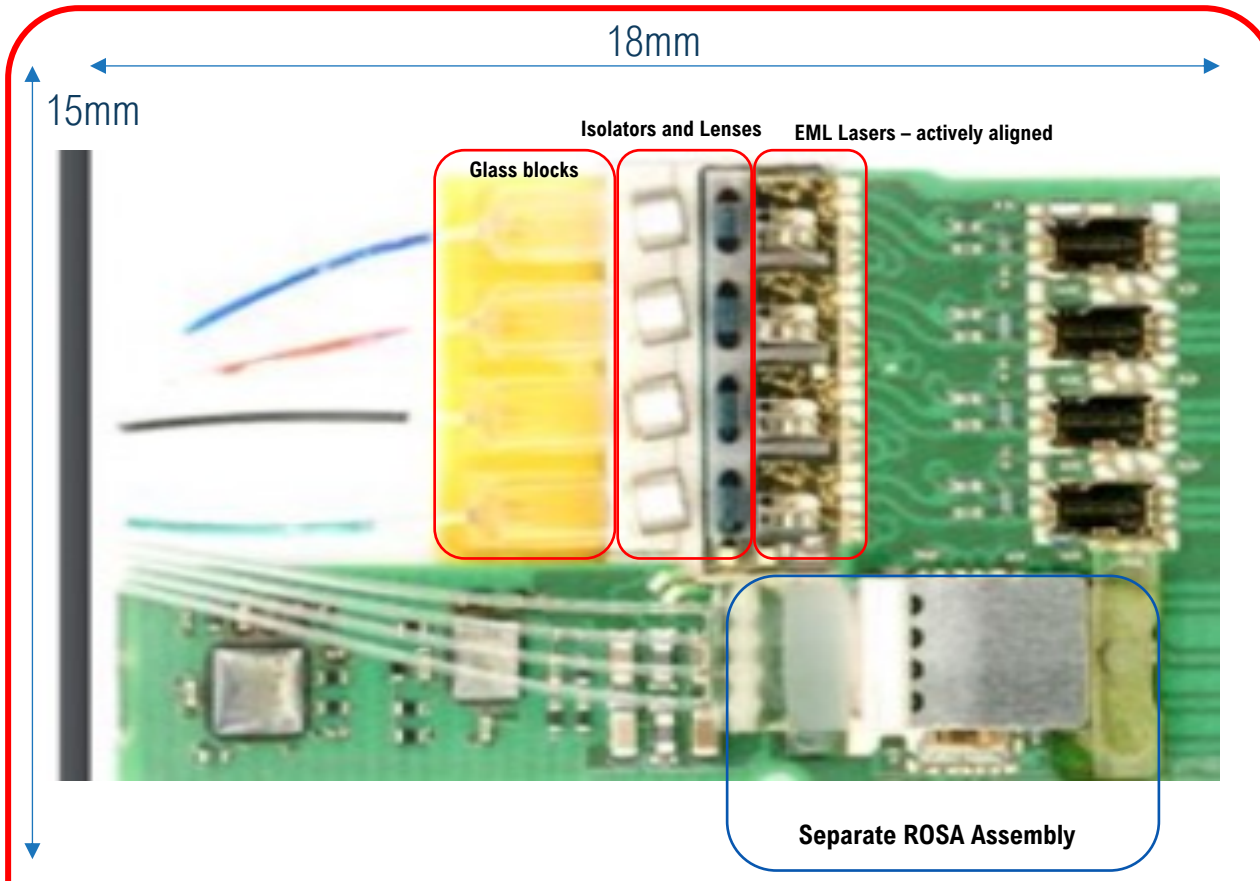
POET's Optical Engine



- Bill of materials: 6 (one for the module manufacturer)
- Active Alignment: 0
- POET SOLUTIONS ARE >4X SMALLER THAN THE SMALLEST CHIP ON BOARD SOLUTIONS IN USE

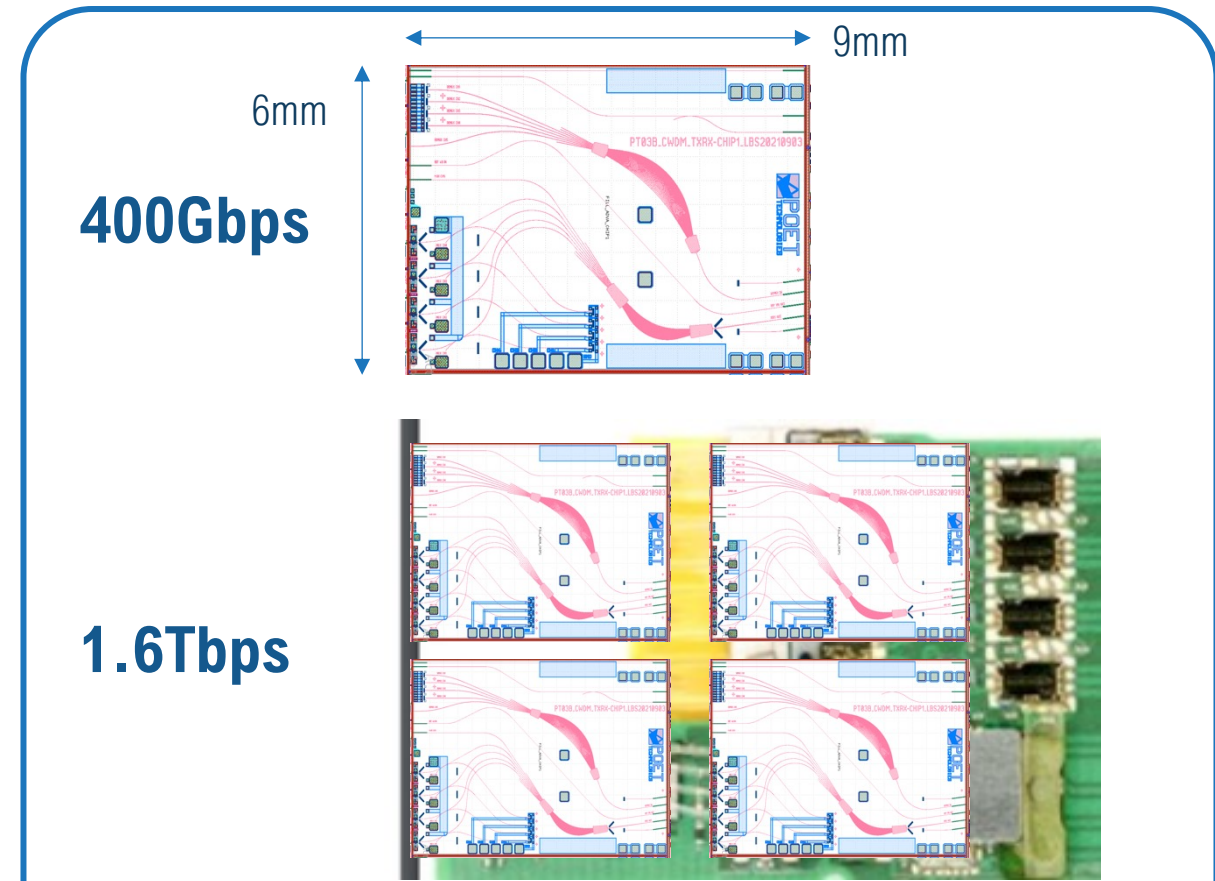
POET's Advanced Chip on Board Solution (400G)

Innolight – DR4



Conventional solutions are un-competitive for multiplexed FR4 applications

POET – FR4



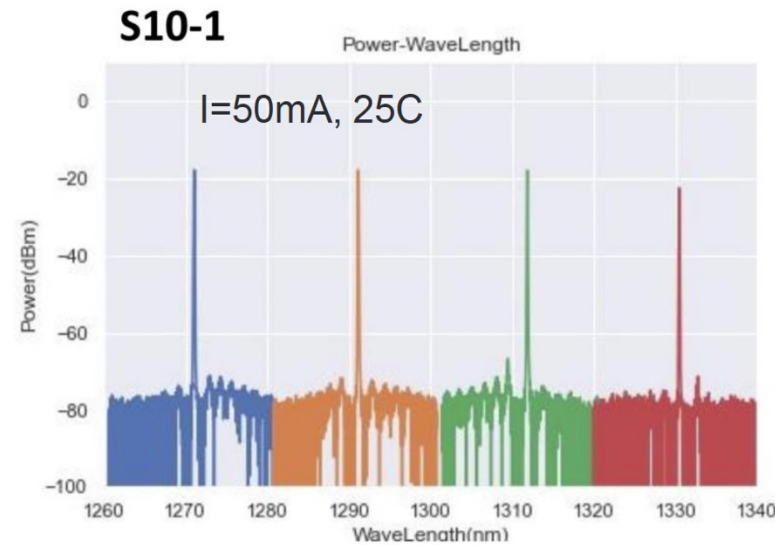
POET's Interposer solutions pack a punch

DML Engines : 5X smaller
SiPh Engines : 3X smaller

The only DML integration platform in the world

Industry Leadership

- Wafer Scale Hybrid Integrated Photonics Packaging Platform
- Low Loss Transmission and Coupling
- DeMux and Mux monolithically integrated into Interposer
- 28G/56G Flip Chip compatible CWDM and LR4 Lasers



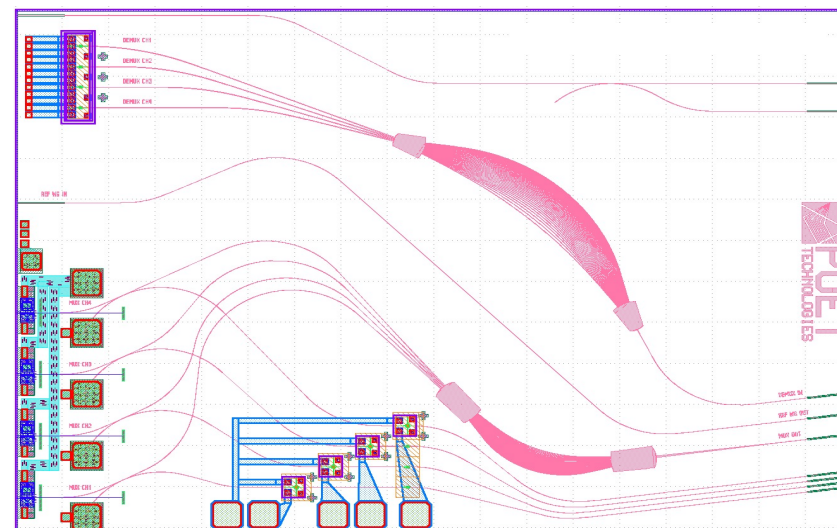
Avg ER : 4.0dB; Avg EMM - 45%



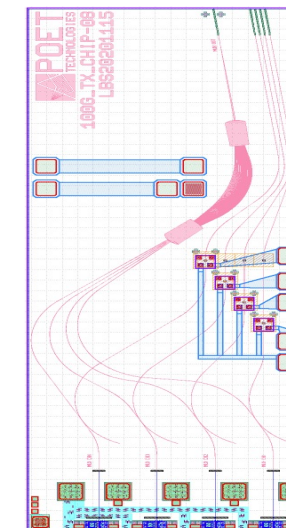
Markets

- CWDM4 and LR4 Data Center Applications
- Custom CWDM/LR4 solutions for Telecom (multiple integrated optical engines in a module)
- 5G Connectivity
- Extensibility 400G-800G-1.6T-3.2T

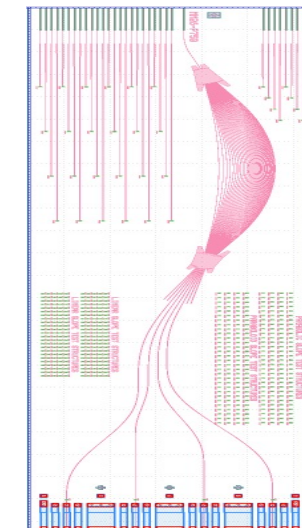
Integrated TRx : CWDM ; 9mm x 6mm



Stand Alone Tx



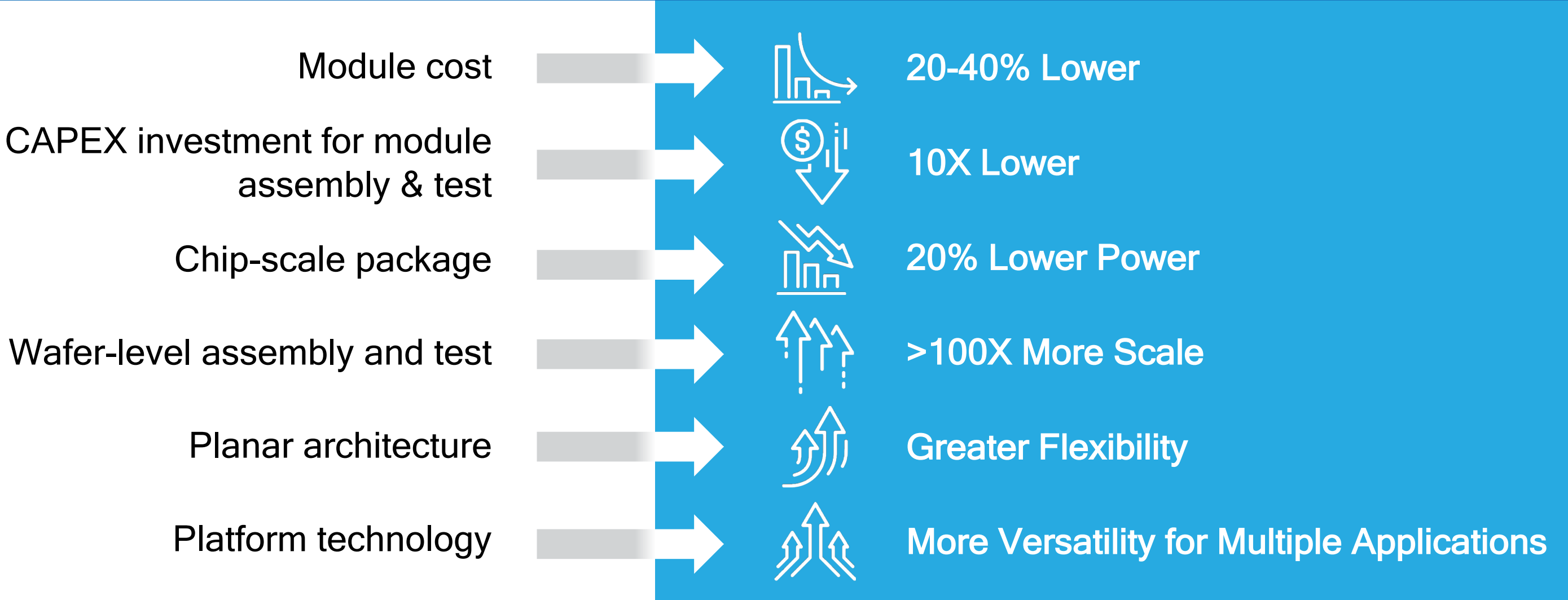
Stand Alone Rx



POET Wins with Optical Interposer Platform



The benefits of POET's Optical Interposer add up to a truly disruptive entry into large-scale photonics markets



 Photonics and Technology Overview

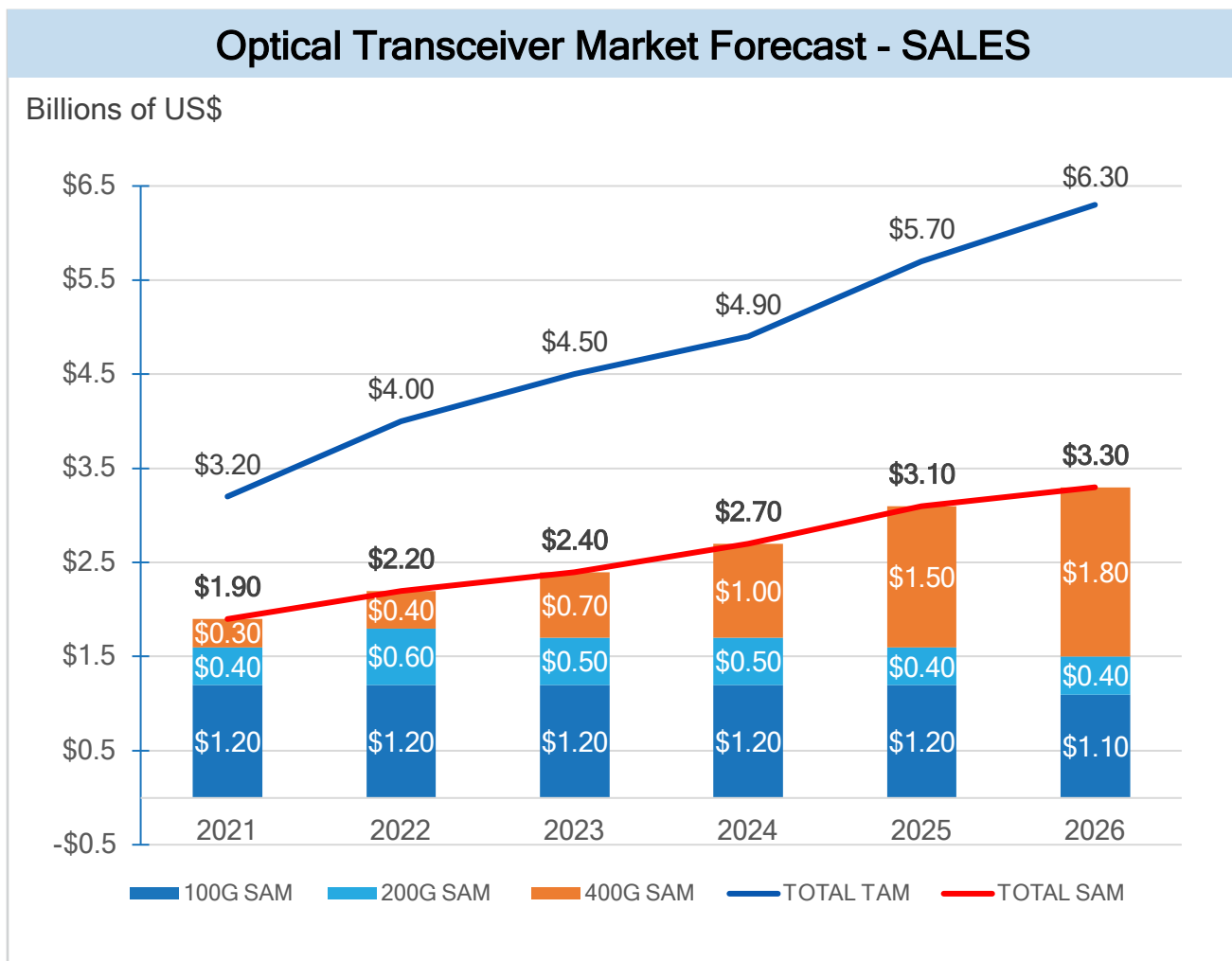
 **Markets and Potentials**

 Products and Roadmap

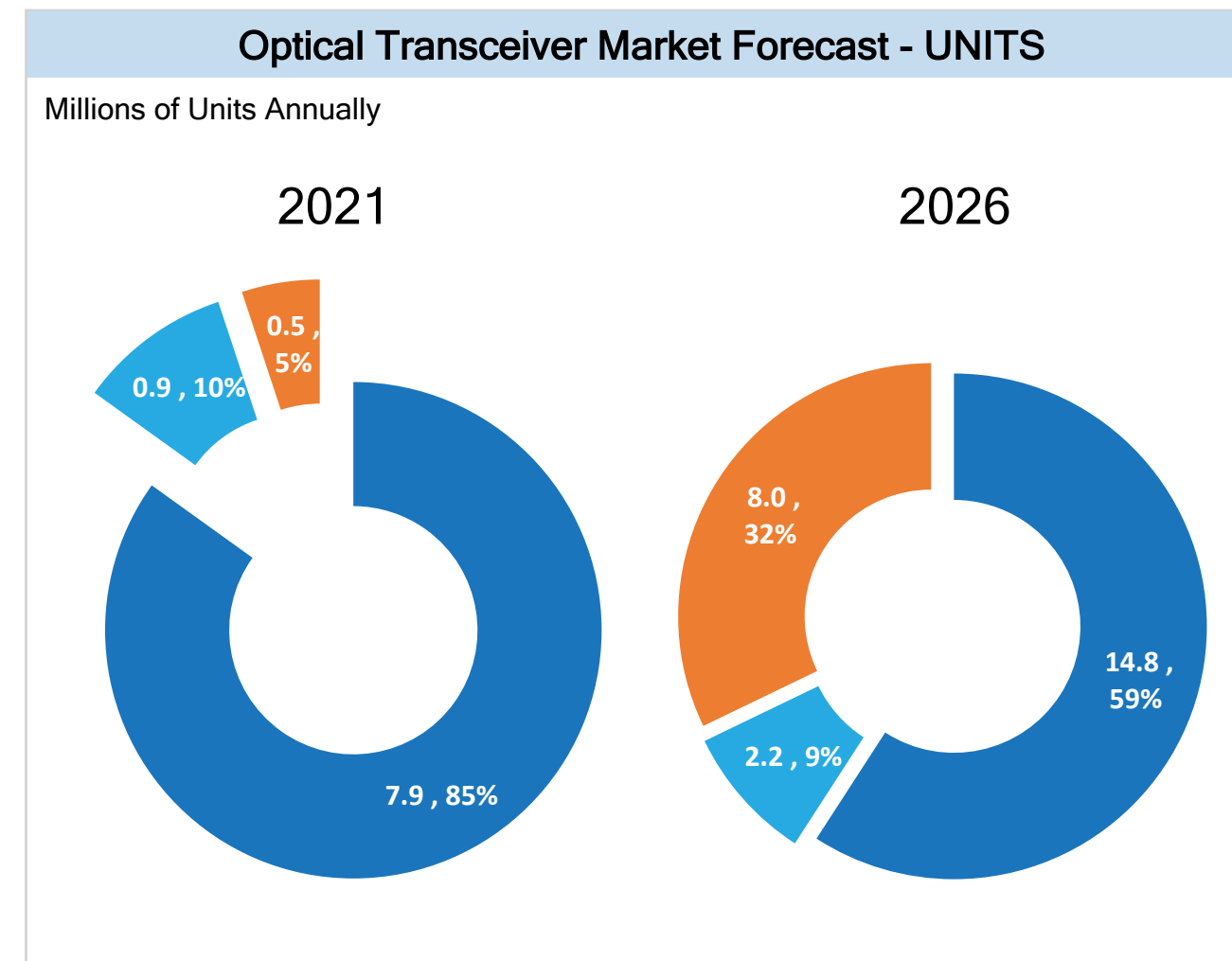
 Customer Engagement

 Operations, Strategy and Capital

Even as 400G emerges, the 100/200G segments continue to be large and attractive served markets for POET



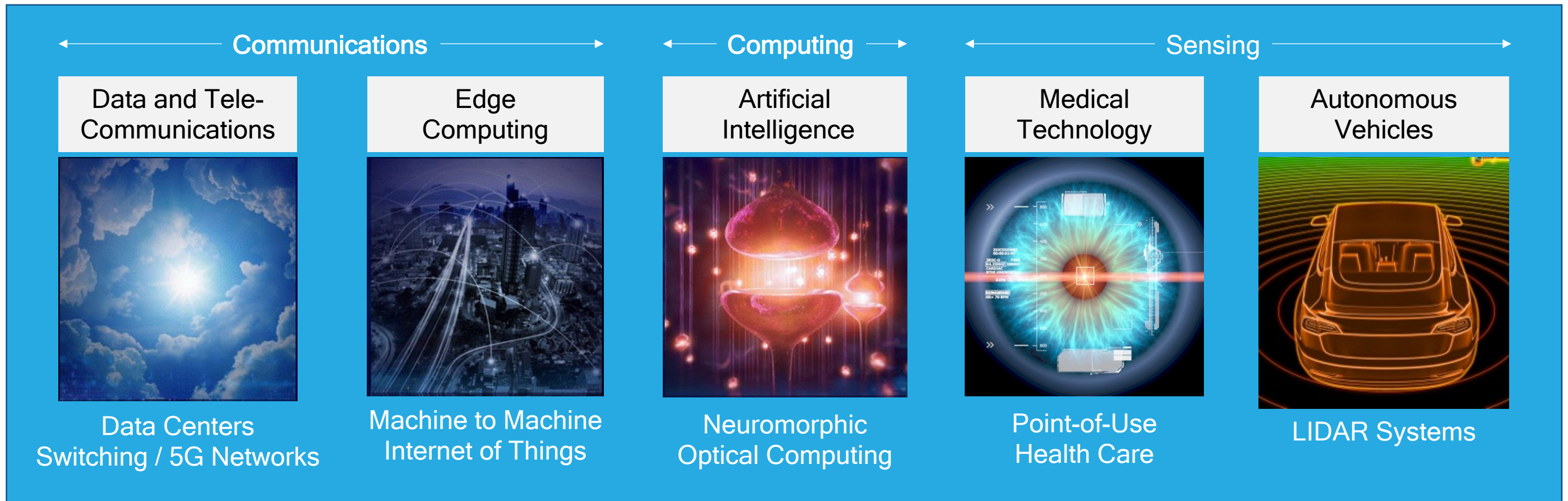
TAM = Total Available Market; SAM = Serviceable Available Market



Many Other Large Markets Need POET's Optical Interposer



The Global Market for Photonics* was >\$576B in 2019 and growing to >\$1.2T in 2030, nearly a 7% annual CAGR



* Source: Prescient & Strategic Intelligence, *Photonics Market Research Report, 2019* - Includes LEDs & Lasers, Sensors & Detectors, Optical Components & Systems

POET's Tech is key to unlocking new Health Tech Apps













POET's commercial focus about to turn to wearable devices, and mobile and medical devices, representing an attractive 2025 TAM of >\$48B

POET's Optical Interposer enables a seamless integration of visible to IR spectroscopy components

Chip scale integration of spectrometers for smart watches and mobile devices

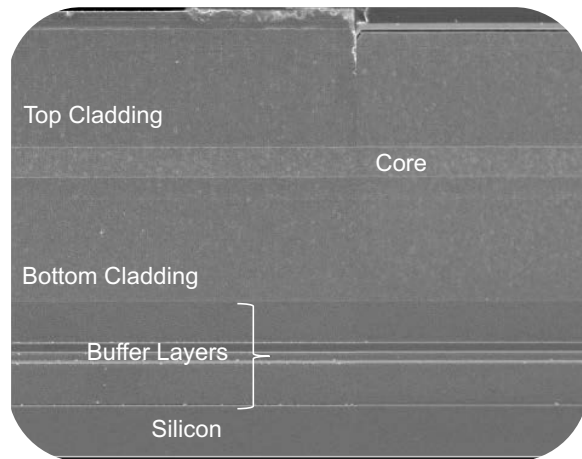
Miniature 3D Sensing and Imaging solutions for Robotic Surgery applications

 Blood Oxygen	 Hydration	 Alcohol
 Heart Rate / HR Variability	 Core Body Temperature	 Glucose Indicator
 Breath Rate	 Blood Pressure	 Carbon Monoxide
	 Lactate	

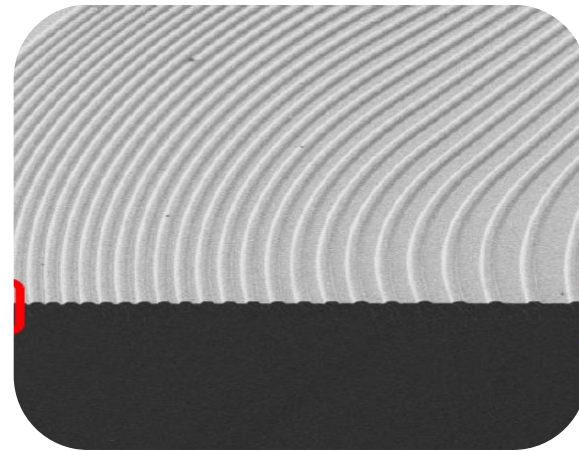
Several critical Bio-markers are detectable using optical spectroscopy methods

POET's Datacoms deployment has matured many building blocks relevant to Chip Scale Spectrometers

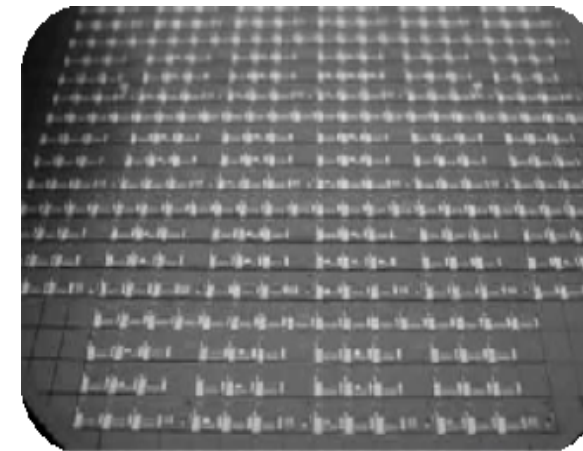
Multi-level Waveguide technology scalable from VISIBLE to NIR



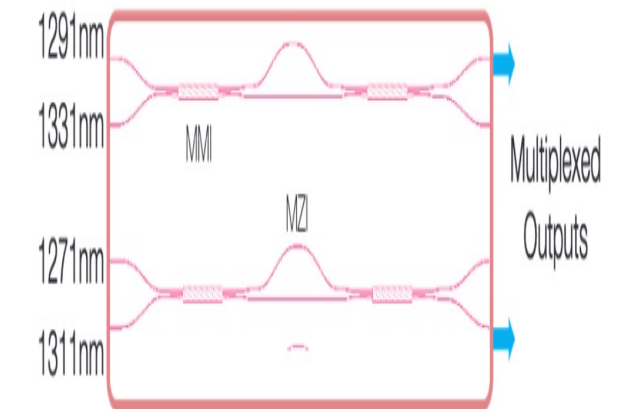
High Resolution Gratings with minimal phase errors



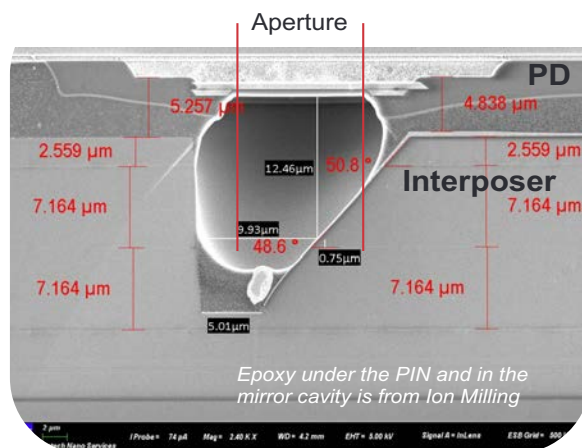
Co-packaging of Electronics and Photonics on a common platform



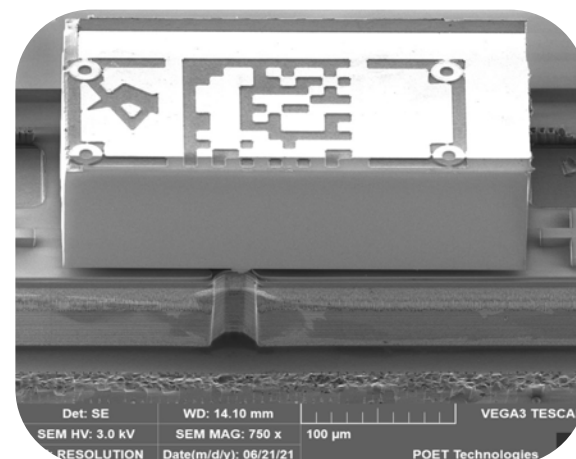
Interferometers, Directional Couplers and Delay Lines



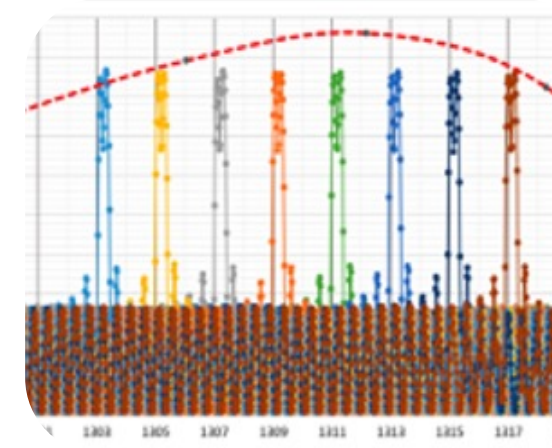
Low Loss out of plane coupling and efficient light detection



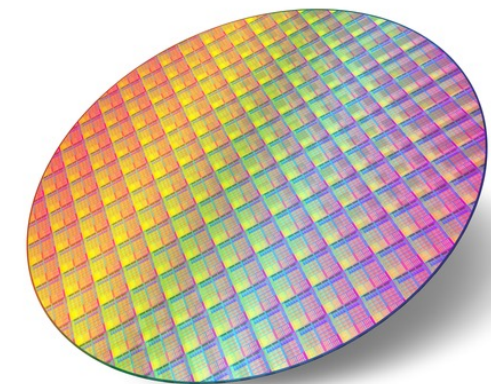
Low Loss In plane coupling of lasers and gain chips



Novel Multi-wavelength athermal external cavity tunable lasers



Wafer Scale Integration to enable Size, Weight, Cost and Performance



POET to Target Medtech / Wearables Markets

\$48B+ TAM in 2025

Large market opportunity as growing universe of healthcare monitoring devices incorporate additional sensing capabilities



Short Term Target Markets



Wearables



Smartphones



Point-of-Care

Additional Market Opportunities

Internet of Things

Hearing Assist

Smart Patches

Smart Bands

Sources: Rockley Photonics, IDC, Counterpoint Research, Strategy Analytics, TrendForce Research, leading consumer electronics manufacturer investor materials.

>\$1B Annual Sales Opportunity in Current and Target Markets



>\$1 Billion Annual Revenue Potential	Transceivers for Datacom	5G Networks	Co-Packaged Optics	Optical Computing and Edge Applications	BioSensing Watches and Mobile Devices	LIDAR
Market Size SAM (peak 2021-28) :	\$2-3.5B annually	\$3-5B annually	\$2-3B annually	\$3-5B annually	\$30B annually	\$1-3B annually
Development Partners:	Tier 1 NA European	Several in play	Several in play	US-based Start-up	Major Chinese or Korean Company	TBD
Strategic Partner(s):	Sanan IC JV Super Photonics	Sanan IC JV Super Photonics	TBD	TBD	Major Chinese or Korean Company	TBD
Potential Customers:	Multiple module makers	Multiple module makers	Data Center Operators and Equipment Suppliers	Computing Platform and Chip Suppliers	Consumer Markets	Auto Sub-Assembly Companies
Revenue Potential:	\$250M+ annually	\$250M+ annually	\$250M+ annually	\$250M+ annually	>\$250M+ annually	>\$250M+ annually

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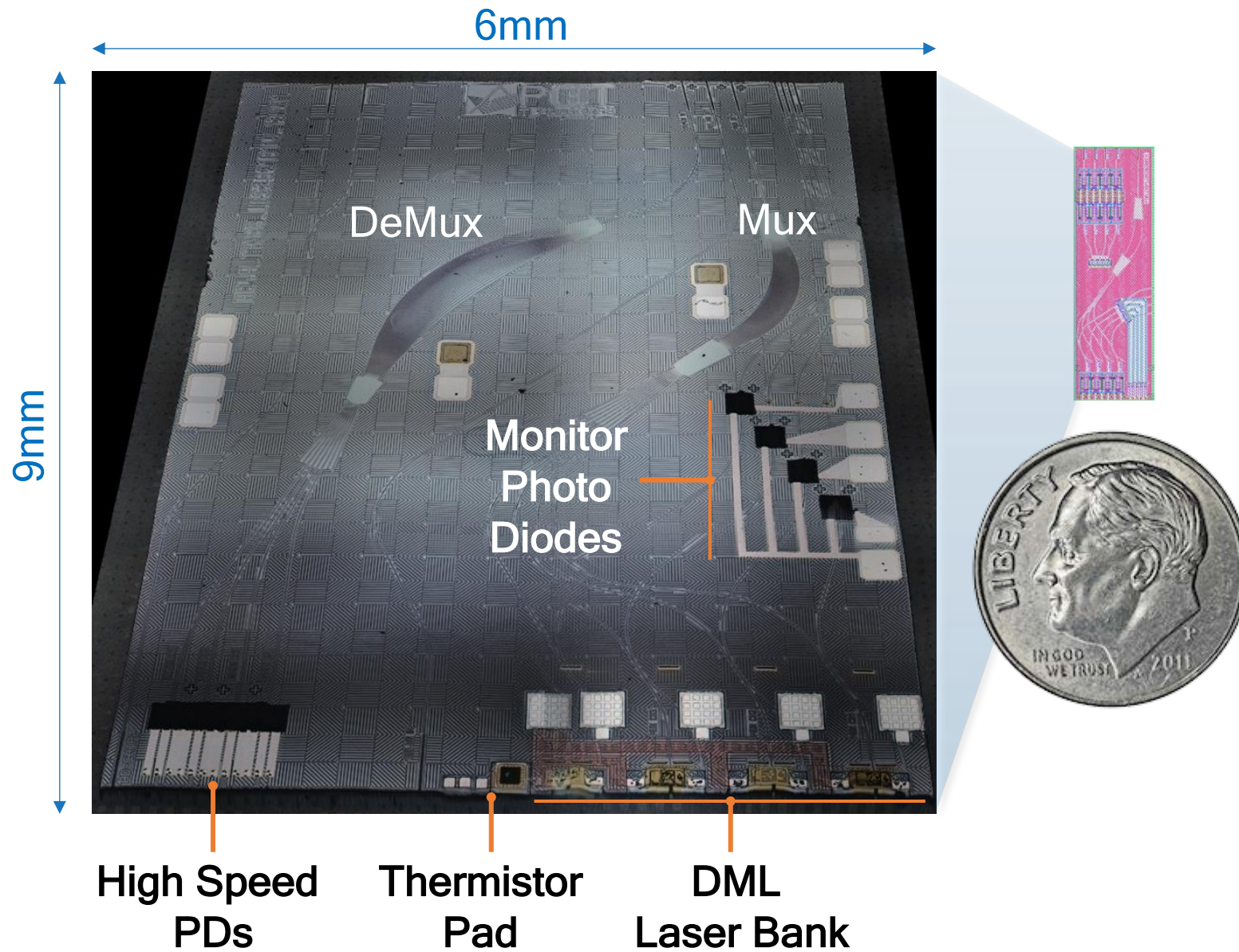
 Markets and Potentials

 **Products and Roadmap**

 Customer Engagement

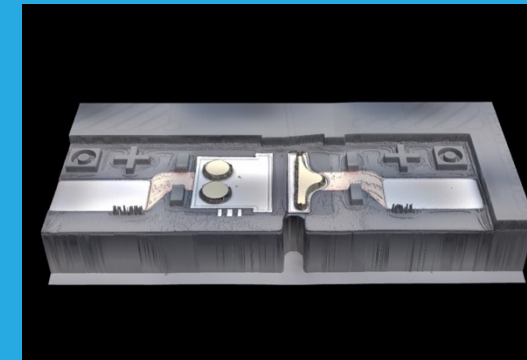
 Operations, Strategy and Capital

100G/ 200G CWDM Optical Engine

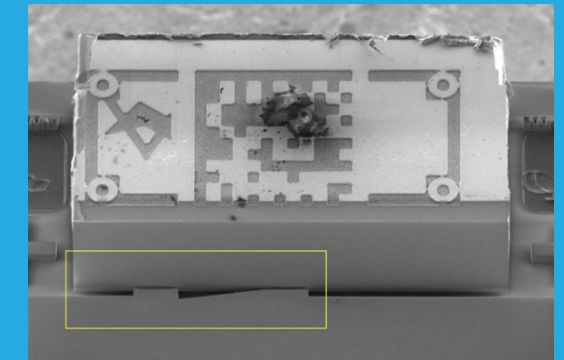


DML Laser Bank

Pre Laser Attach



Post Laser Attach



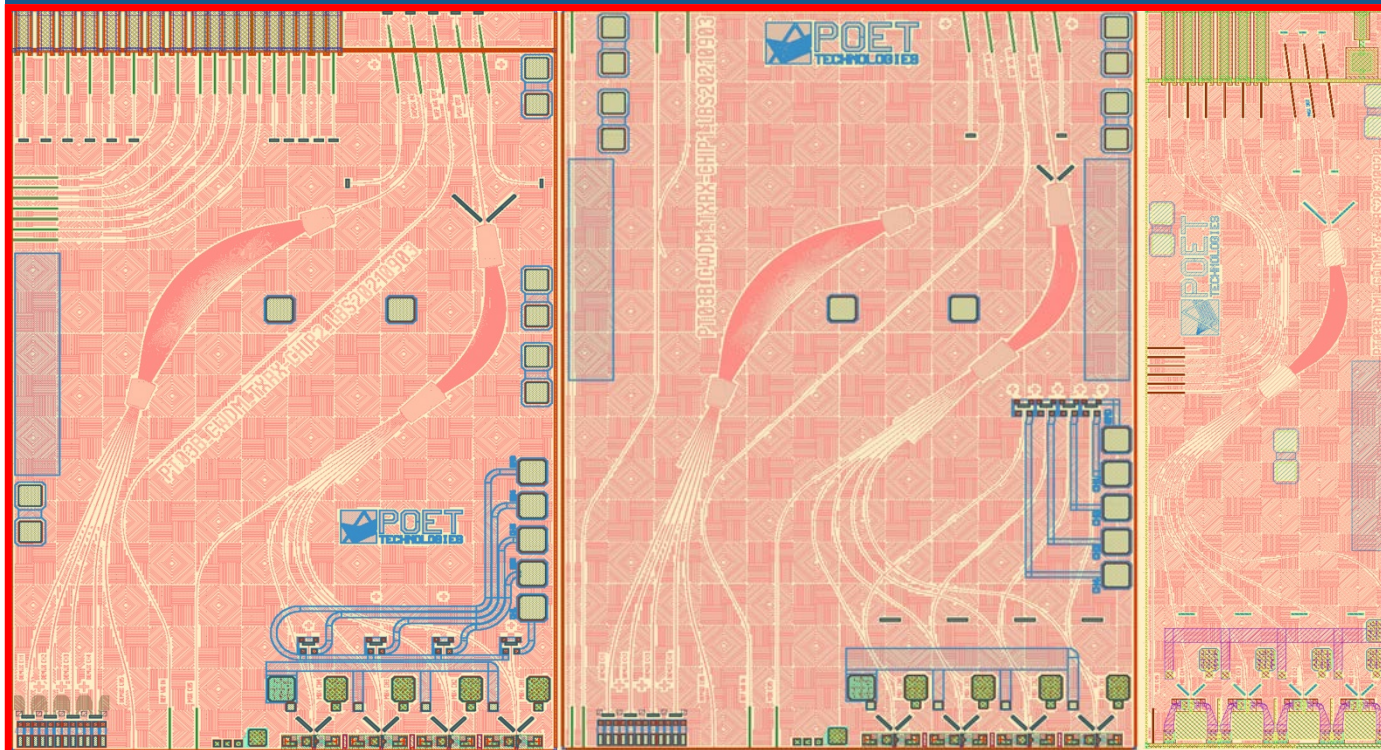
- POET's DML-compatible Optical Interposer Platform produces complete single chip optical engines that can be assembled **PASSIVELY** and at **WAFER SCALE**
- Platform is flexible for both Ridge Waveguide and BH Laser structures (CW and EML)
- Platform can support the flexible requirements of CWDM, LAN WDM, single channel 5G (SFP+), 400G FR4 and co-packaged optics

POET's Platform Enables Rapid Deployment

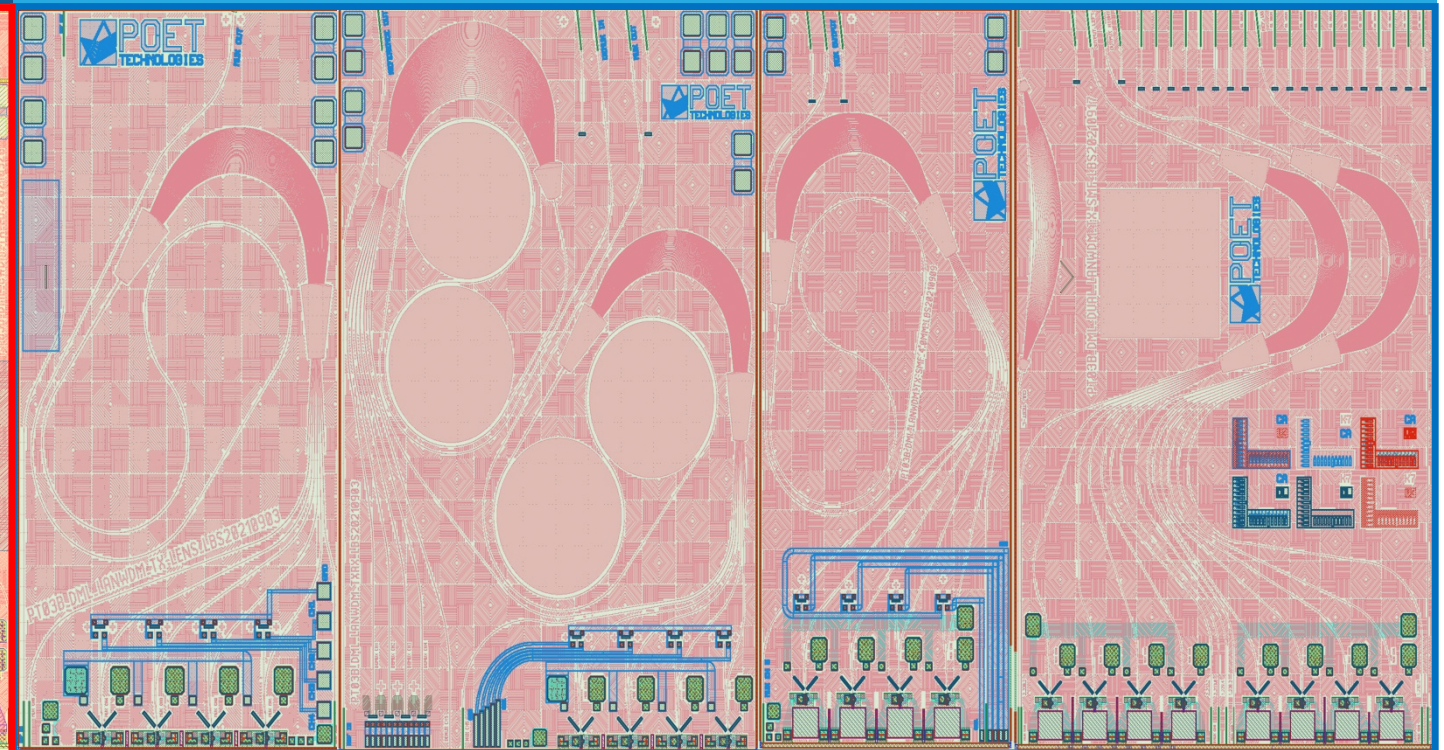


POET's Platform technology enables the reuse of key features and tools, shortening the development process and allowing the launch of multiple products simultaneously

100G/200G FR4 PRODUCTS



100G LR4 PRODUCTS



With the only integration platform in the world for DML/EML type lasers, POET can extend to 400G by changing out the lasers on the 100G / 200G products

Roadmap to Commercial Products

	Alpha	Beta	Production
100G CWDM Solutions TX, RX, TXRX	2H 21	1H 22	2H 22
100G LR4 Solutions TX, TXRX		1H 22	2H 22
200G CWDM and LR4 Solutions	2H 21	1H 22	2H 22
400G Solutions DR1, DR4, FR4 <small>Si Photonics Modulator</small>	1H 22	2H 22	1H 23
Custom Light Bar Solutions*	1H 22	2H 22	1H 23

* Custom implementations ; schedule driven by customer adoption

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TORONTO, Ontario,
October 5, 2021

POET Technologies Announces Design Win and Purchase Order from Leading Systems Company

TORONTO, Ontario and
SHENZHEN, China,
September 29, 2021

POET Technologies Launches Its Products and Optical Interposer Platform in China to Critical Acclaim
Live Product Demonstrations Yield Numerous Customer Engagements

TORONTO, Ontario and
SHENZHEN, China,
September 9, 2021

POET Technologies Teams-up with SiLUX Technologies to Demonstrate its 400G Optical Engine during China International Optoelectronics Exhibition

POET Enters China Market to High Acclaim!



6

Product Demonstrations

60

C-Suite and Exec Staff

20

Leading Optics Companies

2

Committed Customers

>10

Sample Backlog

>2

Strategic Discussions

Engaged with Leading Companies

Customer Traction at Leading Module and System Companies



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World Class Management Team



Executive Team



Dr. Suresh Venkatesan
CEO and Chairman

- SVP Technology at GlobalFoundries
- Various Senior roles at Motorola & Freescale Semiconductors



Vivek Rajgarhia
President & General Manager

- SVP and GM, MACOM
- CEO and Co-Founder, Optomai
- Lucent, OpNext, GigOptix



Thomas Mika
Exec. Vice President & CFO

- Chairman, Rennova Health
- Chairman & CEO, Tegal Corporation
- Co-Founder IMTEC (M&A Boutique)

Engineering and Operations Team



Edward Cornejo
VP, Product Marketing

- Sr. Director, MACOM Technologies
- Google Fiber, Opnext, Lucent and Lytel



Dr. Jinyu Mo
SVP & GM, Asia

- Sr. Director and Chief Scientist, MACOM Technology Solutions
- Founder/CTO, Nexwave Photonics
- Huawei, Oclaro, I2R



Kevin Barnes
VP, Finance and Administration

- Controller, EC English
- Duguay and Ringler Corporate Services



Dan Meerovich
VP, Product Engineering

- Director, Product Engineering at MACOM
- Broadcom, Multiplex



James Lee
VP and GM, Singapore

- VP Logic Technology, IMEC
- Various Senior roles at GlobalFoundries and Chartered Semiconductor

50 Employees
45 Engineers/Techs
12 PhDs

Global Development and Manufacturing



Asset and Capex Lite Manufacturing Strategy

POET Owned Processes and Design including Consigned Equipment

High-Volume Wafer Foundry (Silterra)



Optical Interposer Fabrication

- ✓ 30 K+ wafers per month capacity

High-Volume III-V Semiconductor Foundry (SAIC)



III-V Semiconductor Active Optics

- ✓ Largest III-V Compound Semiconductor manufacturer in the world
- ✓ Large scale

POET - SAIC Joint Venture



Wafer Scale Integration and Test (Super Photonics)



Joint Venture between POET and SAIC

- ✓ SAIC invests capex to scale manufacturing
- ✓ Large local market in China

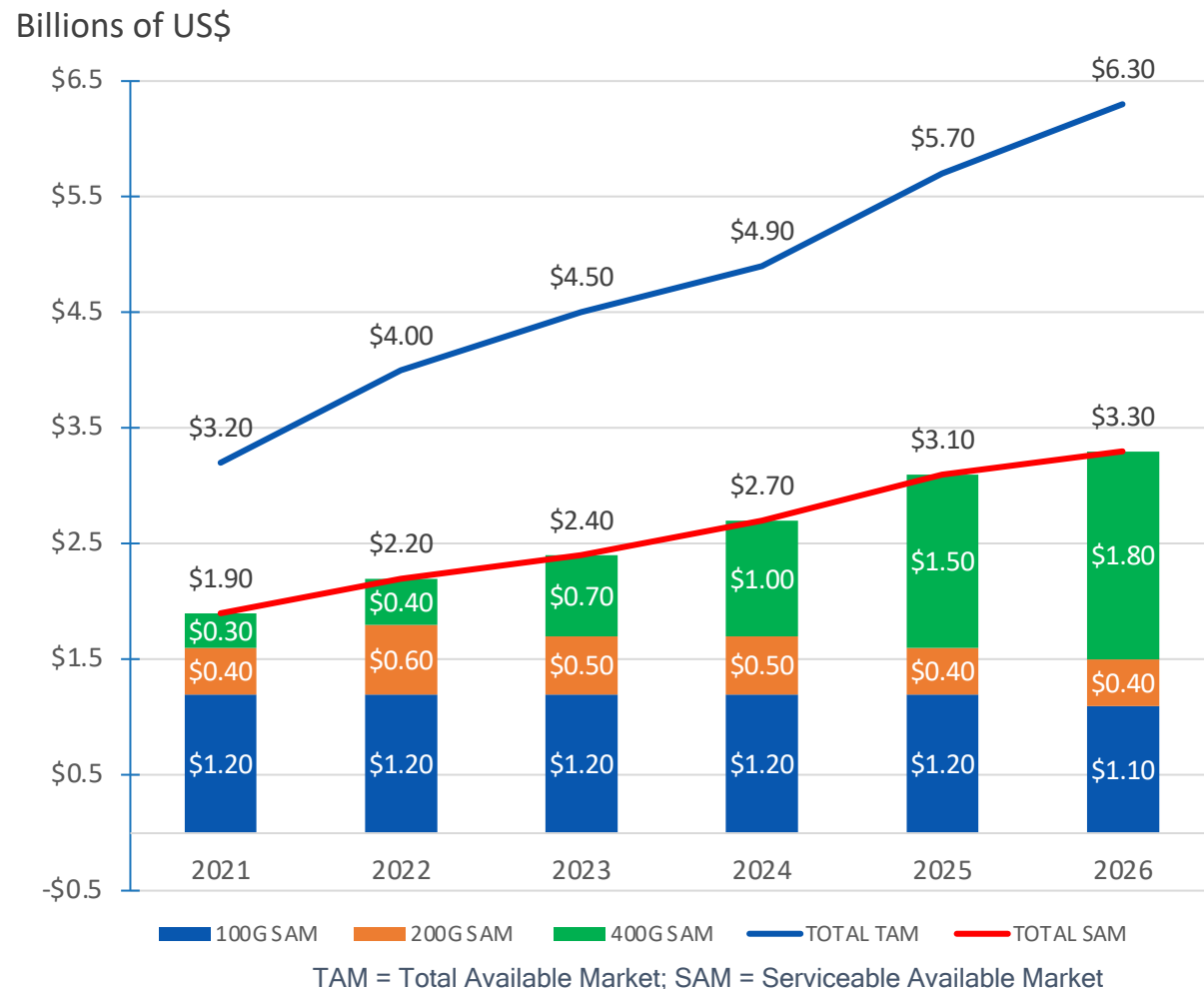
POET, SAIC and Super Photonics constitute a pseudo-vertically integrated model for unparalleled cost efficiency

Range of Forecasted Revenue for SPX

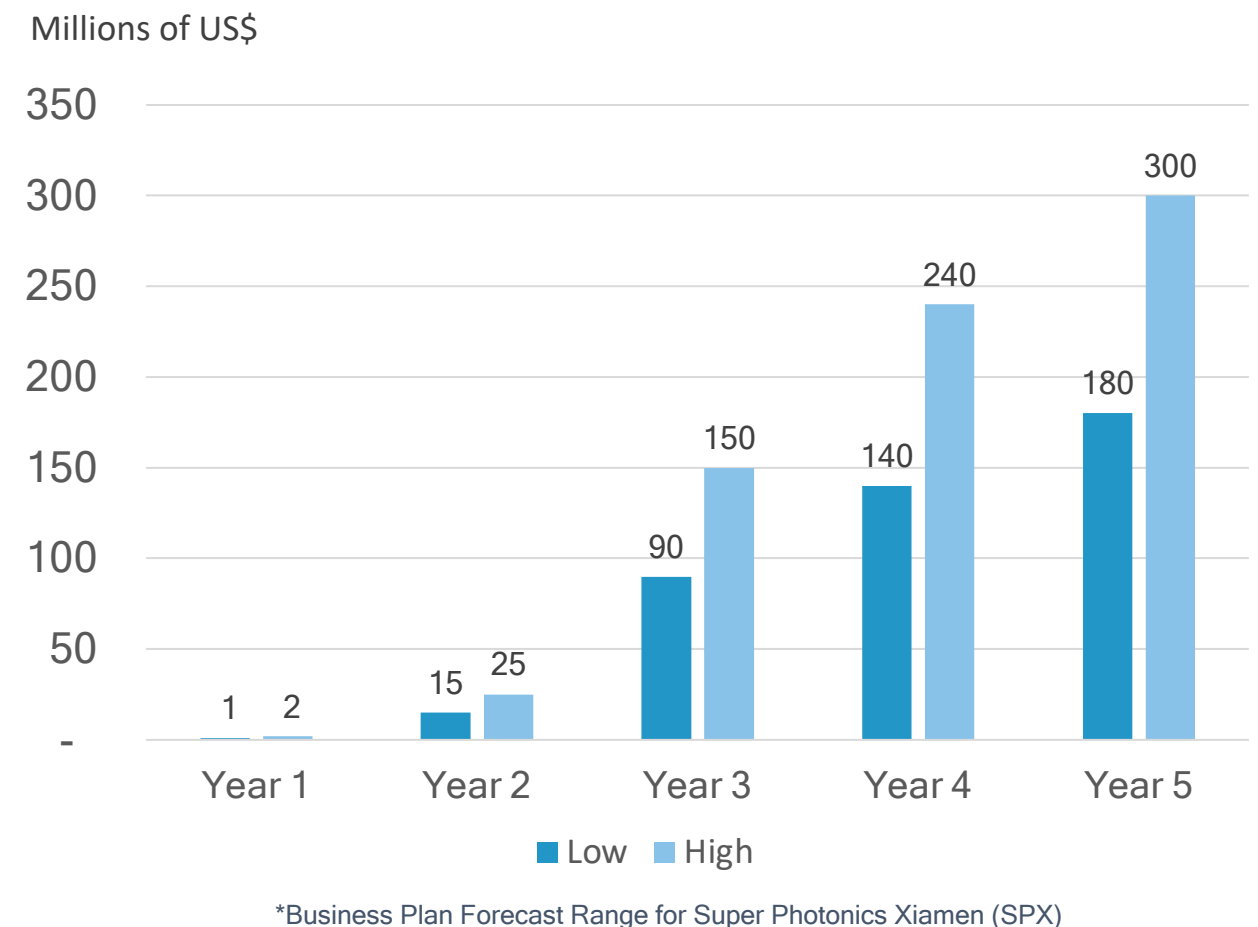


POET successfully competes in existing large segments (100/200G) of the optical transceiver market and in emerging segments like 400G

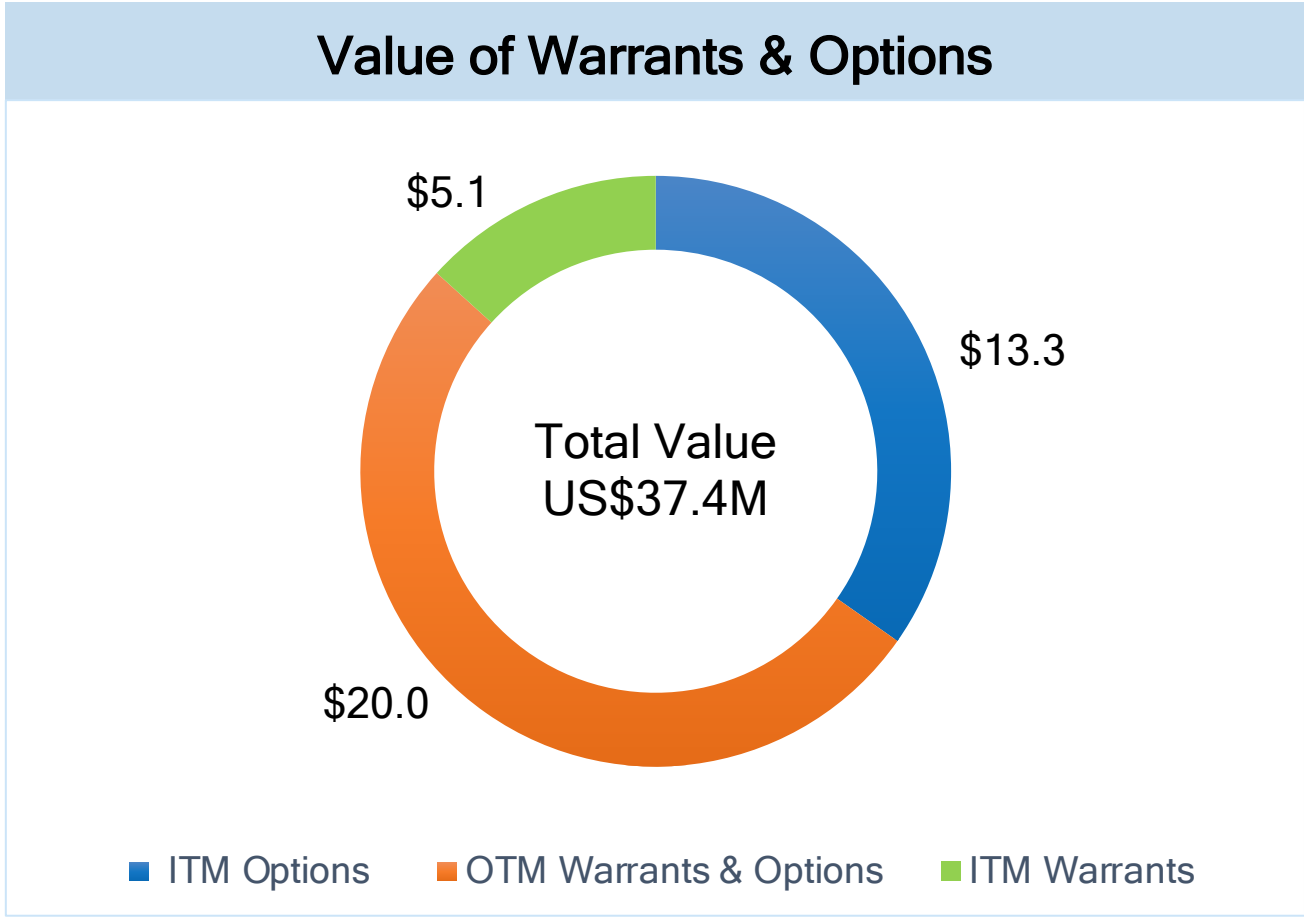
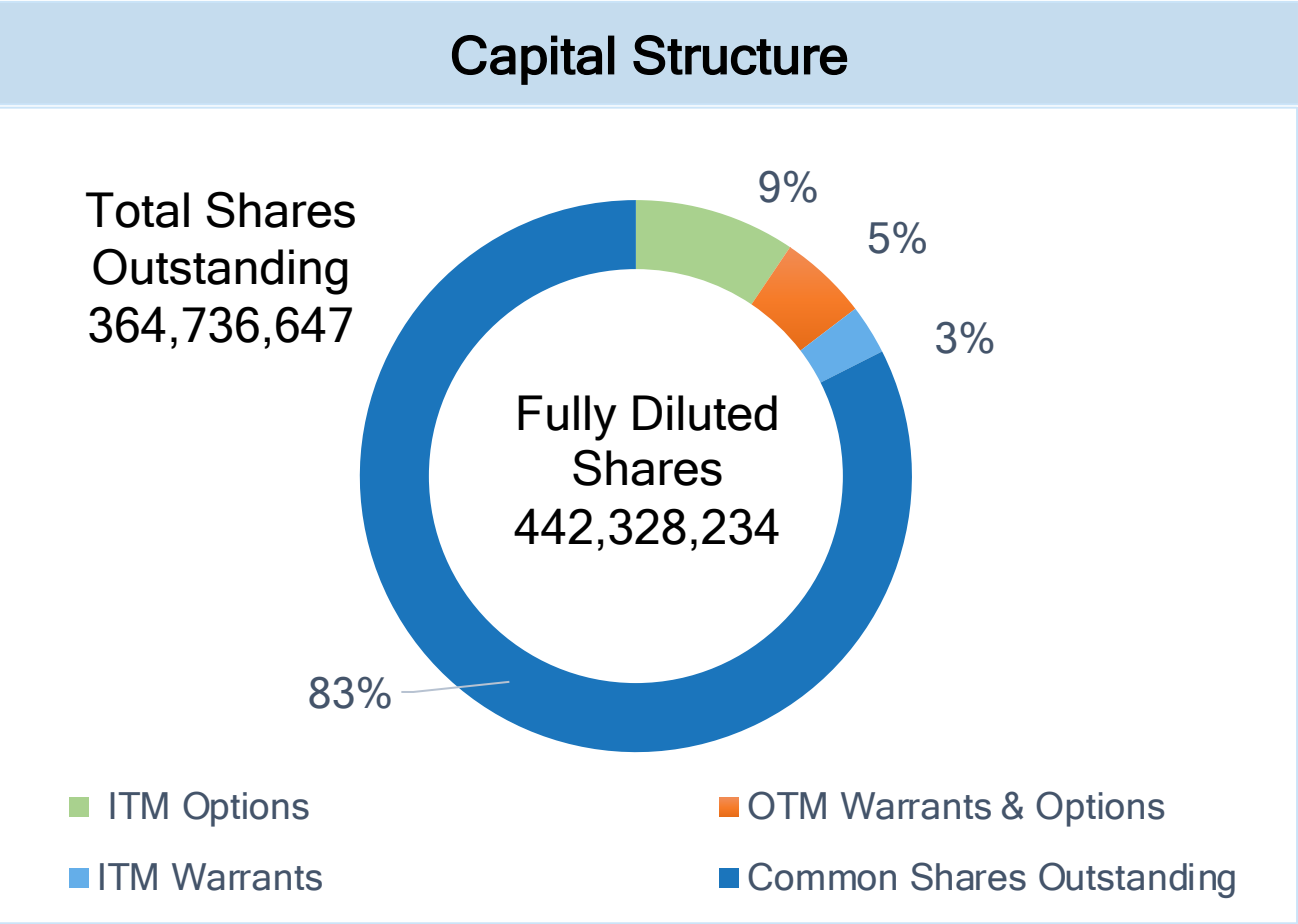
Optical Transceiver Market Forecast - SALES



Forecasted Revenue for 100/200/400G*



Cash at 11/03/21: ~US\$23.8M; Cash Burn of ~\$1M/month
 Five-year Warrants Expired on Nov. 2, 2021: Strike Price C\$0.52 (US\$0.39) - 97% Exercised
 Outstanding Warrants include 11.8M (C\$0.50) and 18.7M (C\$1.15) Expire Feb - Sept 2023



ITM = IN THE MONEY OTM=OUT OF THE MONEY

Why Invest in POET Now?

- **Technology proven** out by leading companies
- **First rate management team** with public company track records
- **Disruptive technology** applying to large and known markets with **huge potential**
- Just entering **New Product Introduction / Commercialization** stage (revenue ramp in 2022)
- **Not widely known** outside of Canada (TSXV and OTCQX in the US)
- **Co-invested in China** with Sanan IC for manufacturing operations and local development and sales
- **Nasdaq listing** in Q1'22



Overall Business Strategy

- 
- 1 Support SPX as an independent company to drive growth in optical transceivers and deliver maximum cash flow to partners
 - 2 Continue to engage with industry leaders and incumbents to design, develop and sell devices based on the Optical Interposer
 - 3 Exploit “localization” imperative in China to expand scope of existing operations and to seek both organic and inorganic growth opportunities and exit strategies
 - 4 Form additional partnerships in target sectors to establish fabrication and sales operations globally
 - 5 Pursue complementary strategic alliance or acquisition opportunities for inorganic growth
 - 6 Explore technology licensing opportunities for growth in non-target sectors

POET Technologies at a Glance



- POET Technologies has developed a unique hybrid photonics packaging platform targeting applications in high-speed data communications for the large Datacom / Telecom markets
- Built on its highly disruptive Optical Interposer Platform technology, POET's platform delivers compelling value in terms in performance, power, cost and scalability
- POET has established a "fab-lite" business model and a joint venture partnership to enable manufacturing to scale, while maintaining ownership and control over its Intellectual Property
- POET has engagements or contracts with some of the largest Datacom and Telecom Optical companies who represent a sizable market share among POET's target market segments

Optical Interposer Platform

Superior Cost and Scalability	20-40% Lower
Power Consumption	20% Lower
Hybrid Integration	1/10 th Lower Capex
Versatility	Numerous Applications

World's smallest TxRx "Optical Engine on a chip", integrating 4 lasers, 4 high speed photodiodes, 4 monitor photodiodes, Mux/ DeMux, Taps and output fiber coupling features

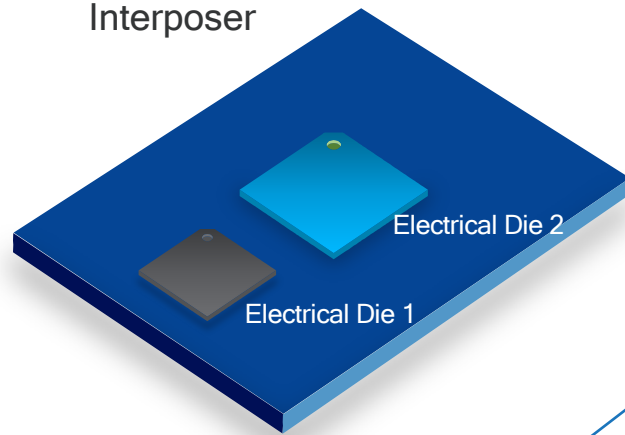
6mm x 9mm

\$20B+ Data Communications Market	5 Customer Engagements	4+ Years of Technology and Product Development
74 + 12 Patents and Patents Pending	\$46M Total Funding* <small>* Capital raised since 2015</small>	

Target Applications	100G 200G	400G	800G CPO
	CWDM4 LR4 Custom	DR1 DR4 FR4 Remote Lasers	DR8 External Cavity Laser Platform

Adding Novel, Patented Waveguide Layers on a Conventional Semiconductor Wafer Enables the Integration of Electronic and Photonic Components at Wafer-Scale

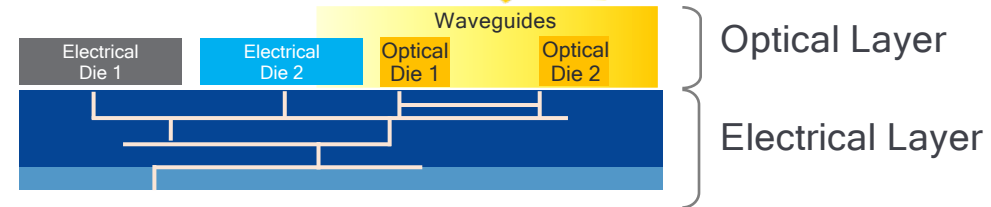
Electrical Interposer



- Typical electrical interposer with high-speed electrical connections among devices has been commonly used in devices like cell phones



Electrical Interconnections

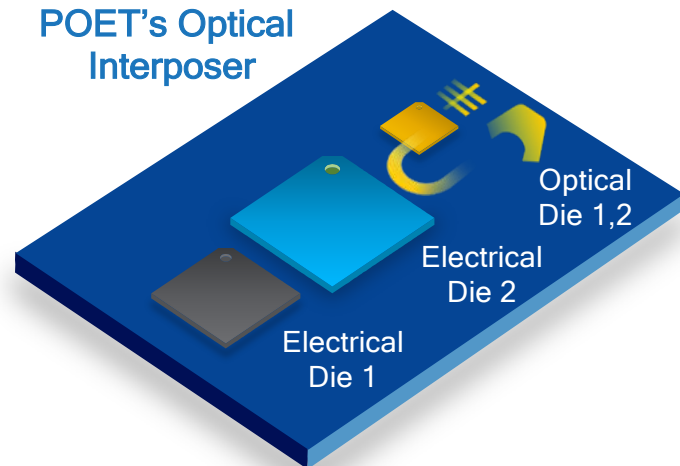


Optical Layer

Electrical Layer

- By adding a layer using a novel material set and patented process, POET created the Optical Interposer that allows photonic devices to communicate seamlessly with one another and with the electronic devices at chip level
- Placement of components is done with automated semiconductor techniques without the need for "active" alignment

POET's Optical Interposer



POET's Solution Lowers Bill of Materials and Capital Cost by 10X



Wafer Level Test Platform



Wafer Level Assembly Platform



Optical Interposer Platform

Enables Photonic Multi Chip Modules with unprecedented scale and cost disruption

JV Adds World-Class Manufacturing and Scale

Super Photonics Xiamen - POET and Sanan IC Joint Venture (JV)

- Virtual vertical integration of manufacturing for Optical Engines
- Ability to rapidly scale production to thousands of devices per month



Sanan IC | Xiamen Sanan Integrated Circuit Co., Ltd.

- Xiamen Torch High-Tech Industrial Development Zone
- US\$500 million investment on 180,000 square meters
- Compound semiconductor manufacturing platform
- Process technologies for microwave radio frequency, high power electronics & lasers



Sanan Optoelectronics Co. Ltd. (Parent)

- LED, filters, power electronics, microwave integrated circuits and optical comms.
- Produces 25 million 6" wafers per year with 4 locations and over 8,500 acres
- US\$1 billion Revenue; US\$14 billion market cap
- Shanghai Stock Exchange (600703)