ANALYST BRIEFING AT OFC 2023

Optical Communications
Now, Next, and Beyond

March 8, 2023

COHERENT

CO-HOSTS

Dr. Giovanni Barbarossa
Segment President Materials
& Chief Strategy Officer

Mary Jane Raymond
Chief Financial Officer

SPEAKERS

Matthias Berger
Vice President, Coherent
Transceiver Technology

Julie Sheridan Eng
Chief Technology Officer

FORWARD-LOOKING STATEMENTS

This presentation contains forward-looking statements relating to future events and expectations that are based on certain assumptions and contingencies. The forward-looking statements are made pursuant to the safe harbor provisions of the U.S. Private Securities Litigation Reform Act of 1995 and relate to the Company's performance on a going forward basis. The forward-looking statements in this presentation involve risks and uncertainties, which could cause actual results, performance or trends to differ materially from those expressed in the forward-looking statements herein or in previous disclosures.

The Company believes that all forward-looking statements made by it in this presentation have a reasonable basis, but there can be no assurance that management's expectations, beliefs, or projections as expressed in the forward-looking statements will actually occur or prove to be correct. In addition to general industry and global economic conditions, factors that could cause actual results to differ materially from those discussed in the forward-looking statements in this presentation include but are not limited to: (i) the failure of any one or more of the assumptions stated herein to prove to be correct; (ii) the risks relating to forward-looking statements and other "Risk Factors" discussed in the Company's Annual Report on Form 10-K for the fiscal year ended June 30, 2022 and additional risk factors that may be identified from time to time in filings of the Company; (iii) the substantial indebtedness the Company incurred in connection with its acquisition of Coherent, Inc. (the "Transaction") and the need to generate sufficient cash flows to service and repay such debt; (iv) the possibility that the Company may be unable to achieve expected synergies, operating efficiencies and other benefits within the expected time-frames or at all and to successfully integrate operations of Coherent, Inc. ("Coherent") with those of the Company; (v) the possibility that such integration may be more difficult, time-consuming or costly than expected or that operating costs and business disruption (including, without limitation, disruptions in relationships with employees, customers or suppliers) may be greater than expected in connection with the Transaction; (vi) any unexpected costs, charges or expenses resulting from the Transaction; (vii) the risk that disruption from the Transaction materially and adversely affects the respective businesses and operations of the Company and Coherent; (viii) potential adverse reactions or changes to business relationships resulting from the completion of the Transaction; (ix) the ability of the Company to retain and hire key employees; (x) the purchasing patterns of customers and end users; (xi) the timely release of new products, and acceptance of such new products by the market; (xii) the introduction of new products by competitors and other competitive responses; (xiii) the Company's ability to assimilate recently acquired businesses, and realize synergies, cost savings, and opportunities for growth in connection therewith, together with the risks, costs, and uncertainties associated with such acquisitions; (xiv) the Company's ability to devise and execute strategies to respond to market conditions; (xv) the risks to realizing the benefits of investments in R&D and commercialization of innovations; (xvi) the risks that the Company's stock price will not trade in line with industrial technology leaders; and/or (xvi) the risks of business and economic disruption related to the currently ongoing COVID-19 outbreak and any other worldwide health epidemics or outbreaks that may arise. The Company disclaims any obligation to update information contained in these forward-looking statements, whether as a result of new information, future events or developments, or otherwise.

TELECOM TRANSCEIVERS NOW, NEXT, AND BEYOND

Analyst briefing at OFC 2023

March 8, 2023

Matthias Berger
Vice President, Coherent Transceiver Technology

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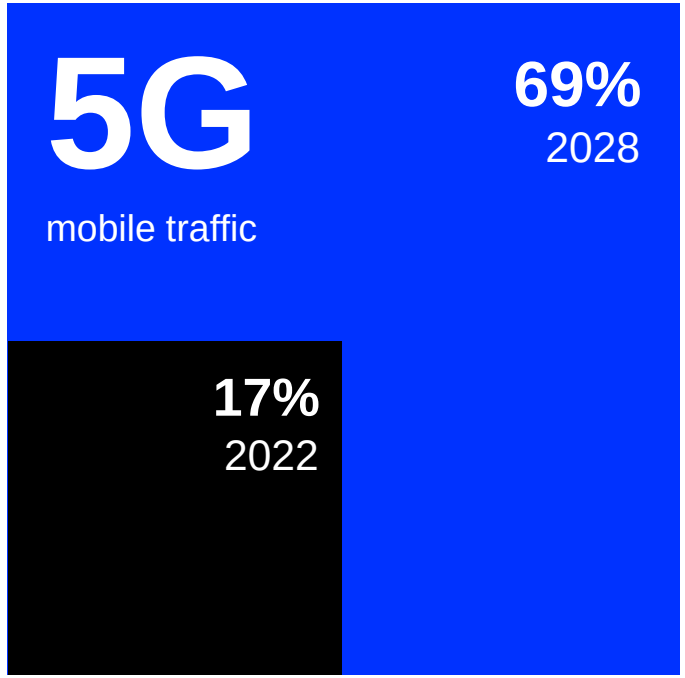
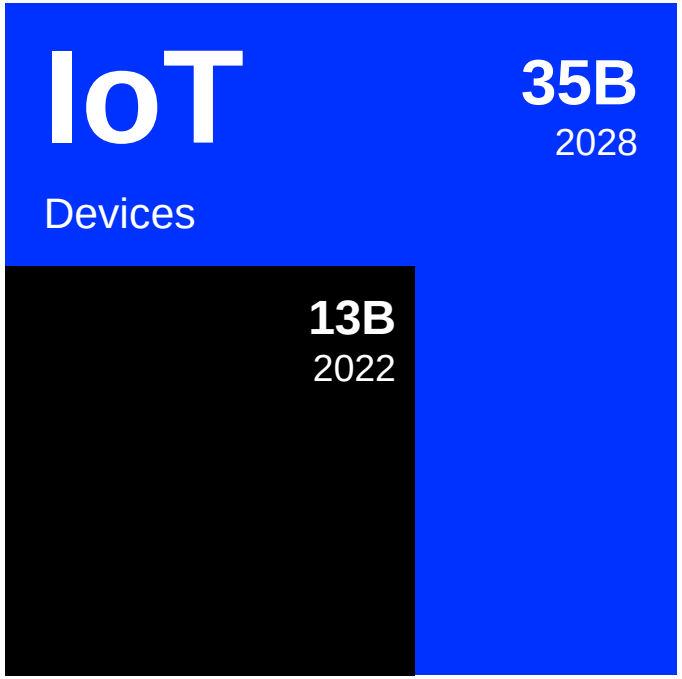
5G IS STILL EARLY IN ITS DEPLOYMENT CYCLE

5G global share of mobile traffic



- Video: 70% of all mobile data traffic

IoTs growing



- CAGR 2022 to 2028: 18%
- Broadband IoT (4G/5G): 60% by 2028

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NEXT-GENERATION BROADBAND SERVICES CONTINUE TO DRIVE APPLICATIONS THAT ARE INCREASINGLY MORE DATA INTENSIVE

Broadband Services
▪ 5G Wireless ▪ Fiber-to-the-home ▪ Broadband cable ▪ Low-Earth-orbit satellites

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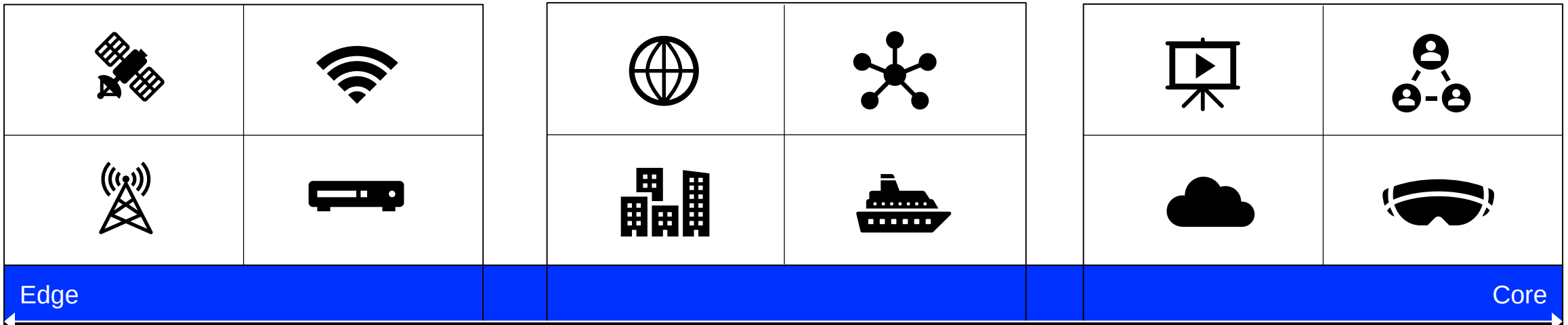
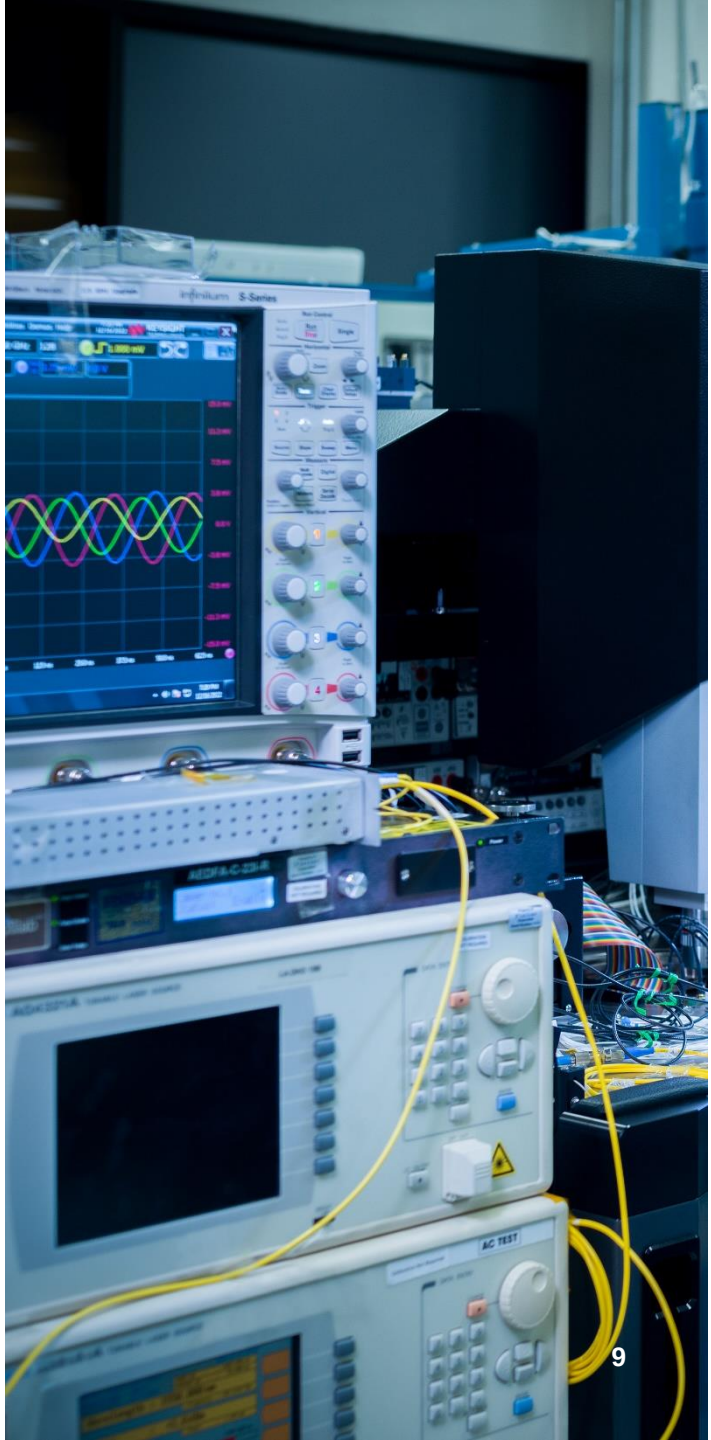
COHERENT IS THE LARGEST SUPPLIER OF OPTICAL COMPONENTS FROM THE EDGE TO THE CORE



Access Networks	Transport Networks	Datacenters
• 5G Wireless • Fiber-to-the-home • Broadband cable • Low-orbit satellites	• Metro • Regional • Long-haul • Submarine	• Video streaming • Cloud services • Social media • Big data/AI/ML

TRANSFORMATIONS IN THE OPTICAL NETWORK NOW, NEXT, AND BEYOND

Now	Next	Beyond
Disaggregation of the transport network driven by the growing influence of hyperscalers	Low power, low cost coherent interfaces move to the **edge of optical networks**	Optical transport data rates **exceed 1Tbit/s**
High level of photonic integration and low power DSPs **enable WDM line interfaces in pluggable modules**	**Communication in space** moves from radio to optics	With continued increase in data rate, physics drives **coherent technologies into datacom** space



Coherent R&D lab in Fremont, CA

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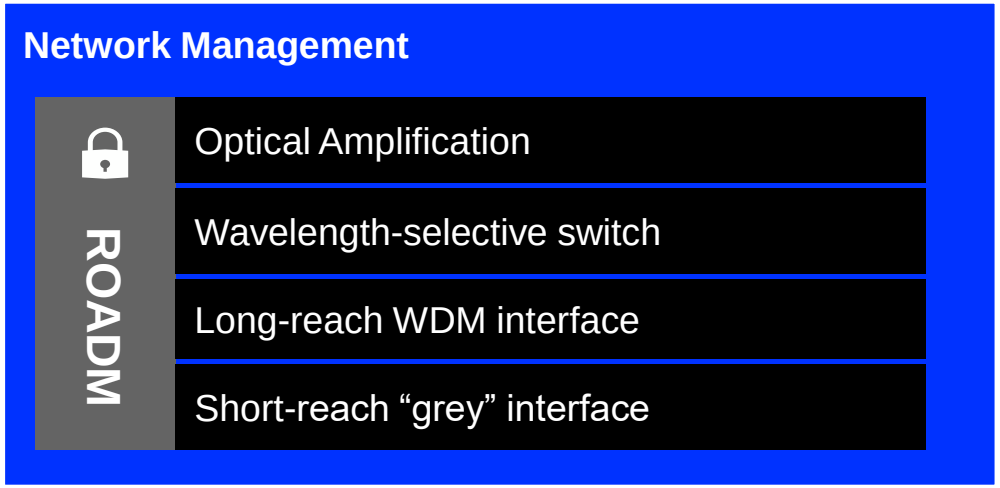
NOW

Disaggregation of the optical transport network

TRANSPORT NETWORKS VS. DATACENTER NETWORKS

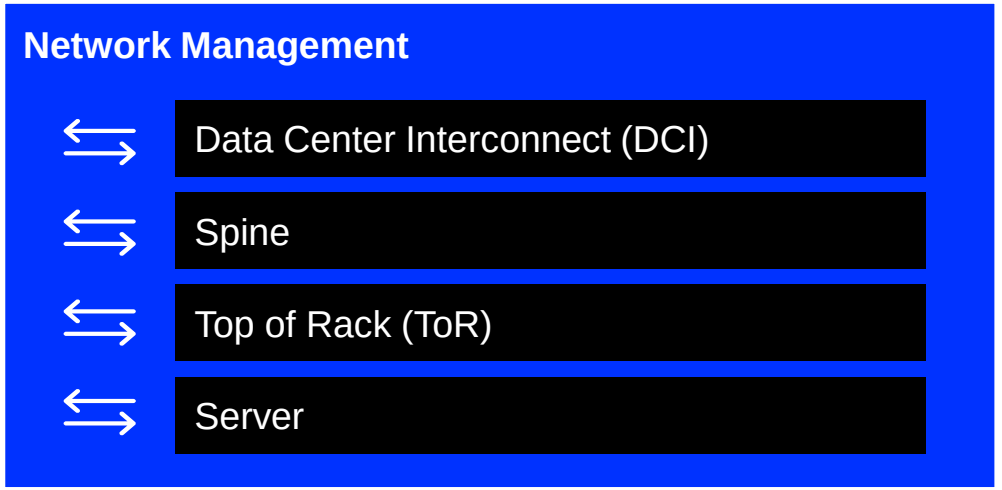
Transport Networks
Integrated Equipment

- Network management developed by equipment vendor
- ROADM vendors assigned network regions
- ROADM connects to 3rd party equipment through short-reach interfaces



Datacenter Networks
Disaggregated Equipment

- Network management developed by cloud providers
- Standard interfaces enables interoperability between any mix equipment suppliers



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DISAGGREGATION BY TRANSFORMING LINE CARDS INTO PLUGGABLE TRANSCEIVERS

Transport Networks
Integrated Equipment

Router
Short-reach “grey” transmission

Pluggable QSFP-DD

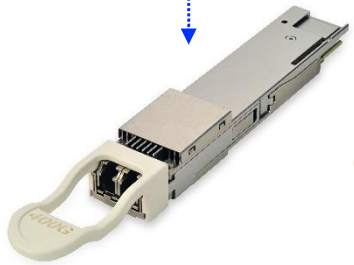
ROADM
- Optical Amplification
- Wavelength-selective switch
- Long-reach DWDM transmission
- Short-reach “grey” transmission

Transponder line cards

Transport network

Transport Networks
Disaggregated Transmission

Router
Long-reach DWDM transmission



OpenZR+ MULTI-SOURCE AGREEMENT

Pluggable 400G ZR+ QSFP-DD

ROADM
- Optical Amplification
- Wavelength-selective switch

Transport network

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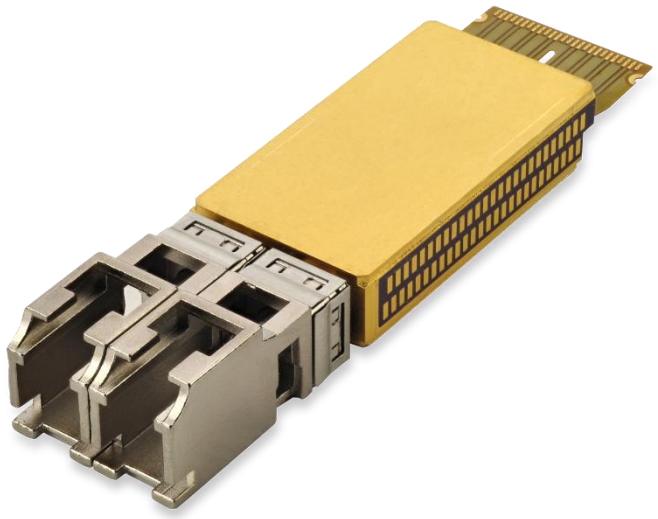
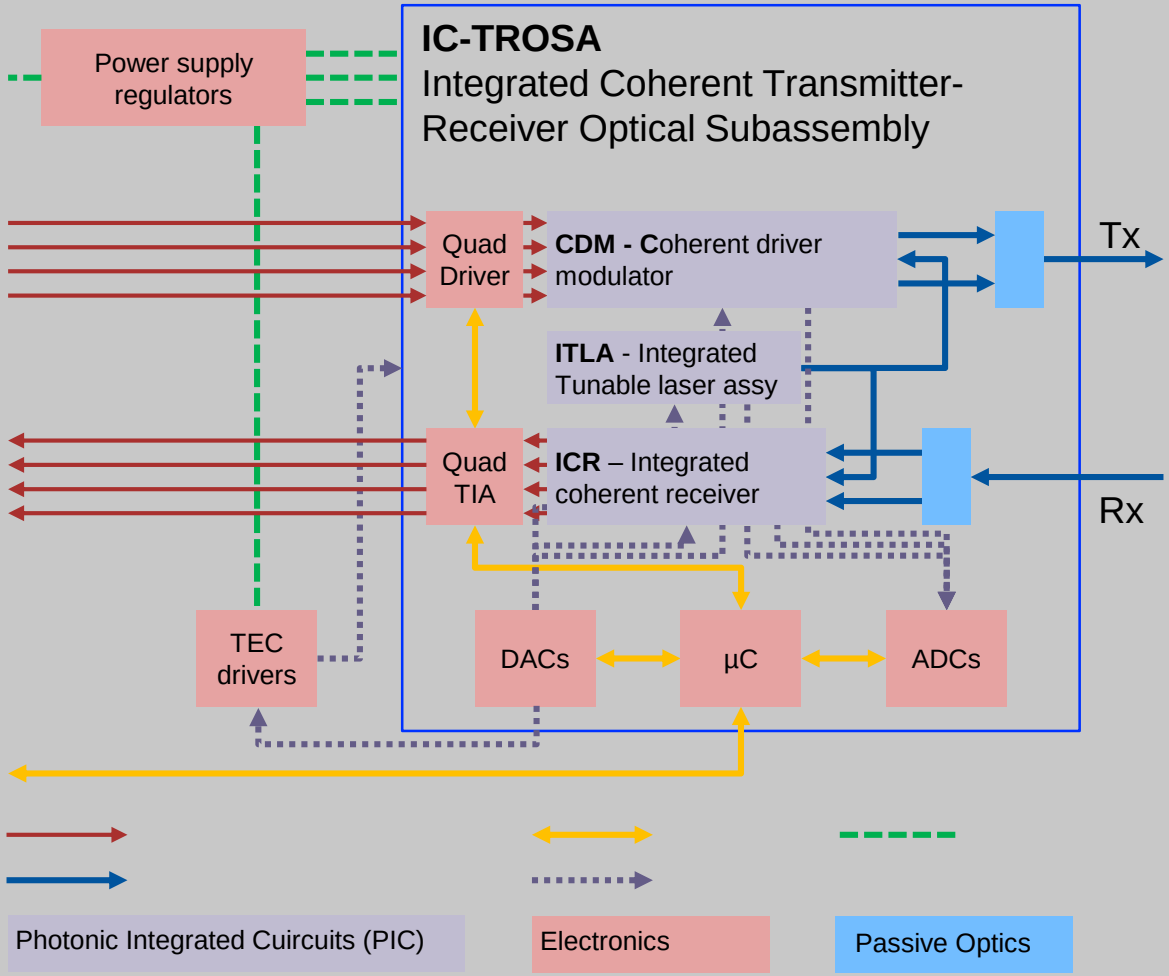
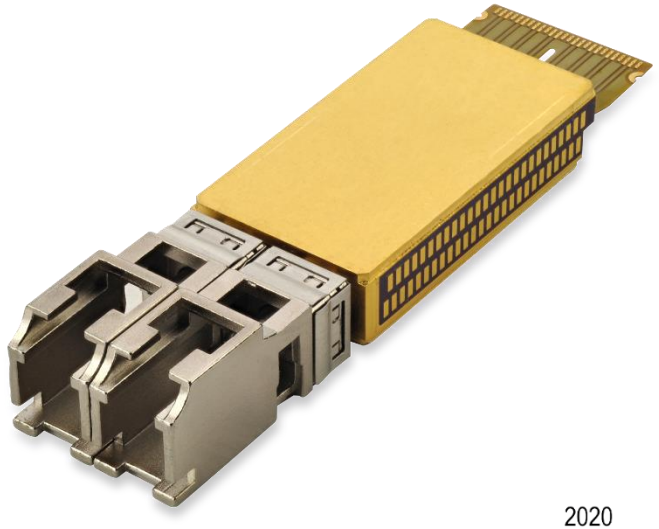
LEAPFROGGING AN ENTIRE GENERATION OF COHERENT OPTICS WITH PHOTONIC INTEGRATED CIRCUITS





INDIUM PHOSPHIDE TECHNOLOGY PLATFORM ENABLES HIGH OPTICAL OUTPUT POWER

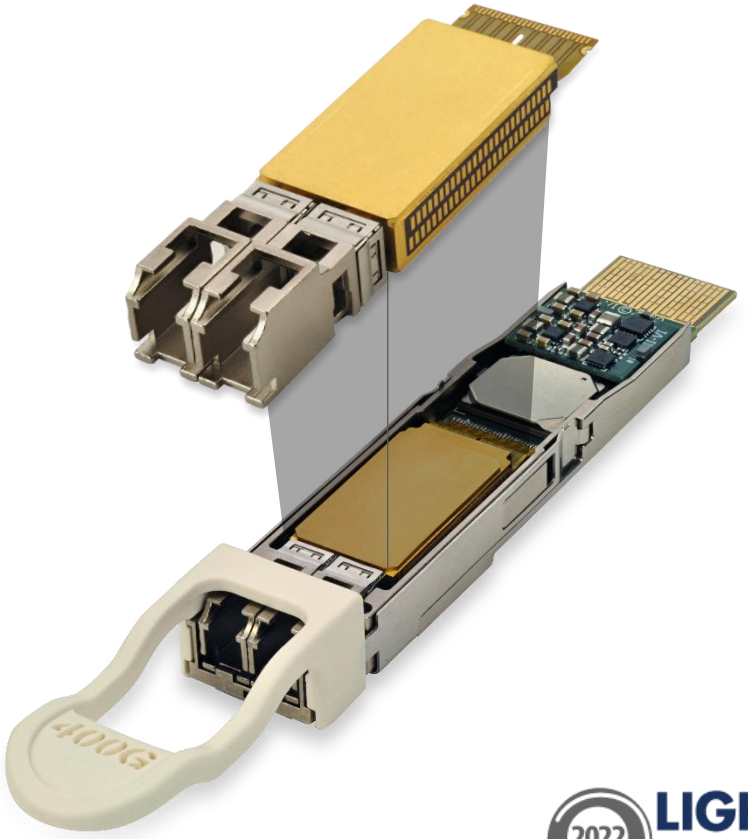


ECOC EXHIBITION INDUSTRY AWARDS 2021

2020 LIGHTWAVE INNOVATION REVIEWS

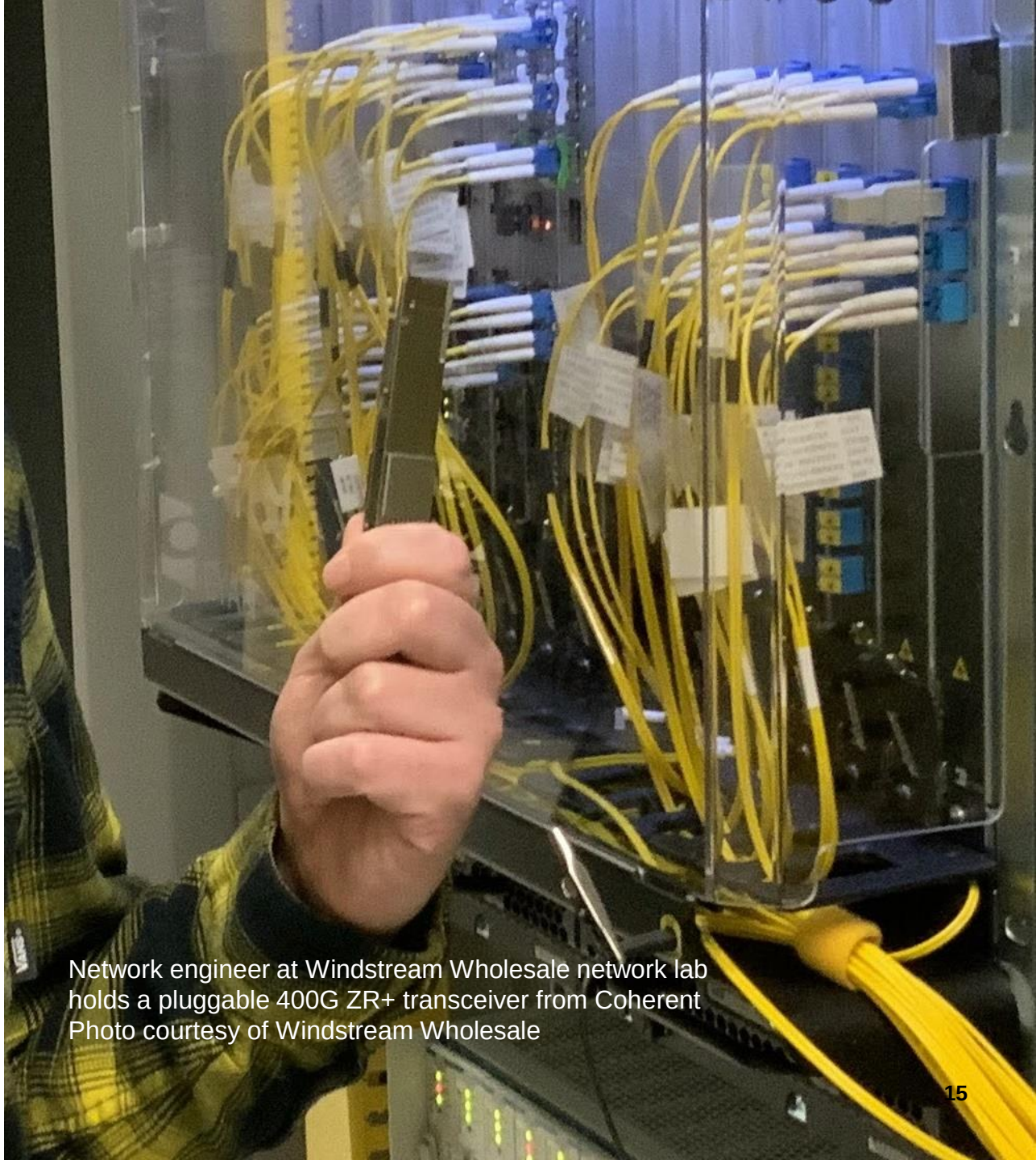
InP fab in Järfälla, Sweden

FEB. 2022: THE INDUSTRY'S FIRST 400G ZR+ IN QSFP-DD FORM FACTOR



ECOC EXHIBITION INDUSTRY AWARDS 2022

2022 LIGHTWAVE INNOVATION REVIEWS



Network engineer at Windstream Wholesale network lab holds a pluggable 400G ZR+ transceiver from Coherent
Photo courtesy of Windstream Wholesale

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NEXT

Coherent transceivers for access networks and satellite links

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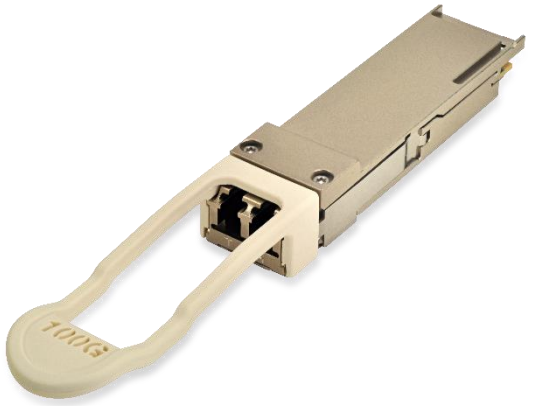
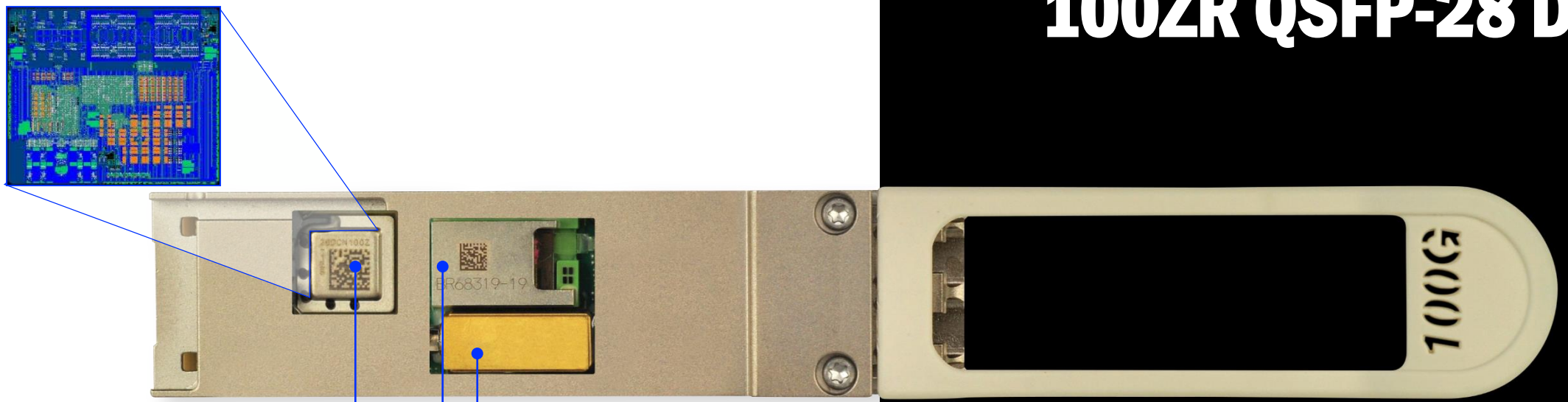
100G ZR QSFP28 ENABLES SEAMLESS UPGRADES IN THE ACCESS NETWORK

10G – 80 km	25G – 15 km	100G – 100+ km
		

COHERENT TRANSCEIVER TECHNOLOGY FOR ACCESS NETWORKS

100ZR QSFP-28 DCO



Steelerton™ DSP purpose-built for small size and low power consumption

Purpose-built power-optimized tunable laser

Highly integrated silicon photonics PIC

2023 LIGHTWAVE 5.0 INNOVATION REVIEWS

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NEXT: OPTICAL COMMUNICATIONS IN SATELLITES

- Point-to-point laser communication links between low-Earth-orbit (LEO) satellites
- Transmission with laser beams is much more efficient that using radio, leading to power reduction which is key in space
- Coherent awarded contract for DARPA Space-Based Adaptive Communications Node (Space-BACN) program.
- Space-BACN: low-cost, high-speed, reconfigurable, laser-based data links to LEO satellites.

THE POTENTIAL TO BRIDGE THE DIGITAL DIVIDE WITH SATELLITE BROADBAND

2.7B

without broadband access*

Strong potential for satellites to reduce the digital divide due to efficient coverage of sparsely populated areas

* 2022 report jointly published by the ITU and UNESCO

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BEYOND

Multi-terabit coherent transceivers for datacenters

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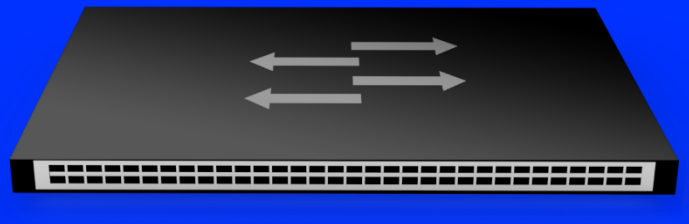
MULTI-TERABIT COHERENT TRANSCEIVERS FOR PETABIT PER SECOND SWITCHES

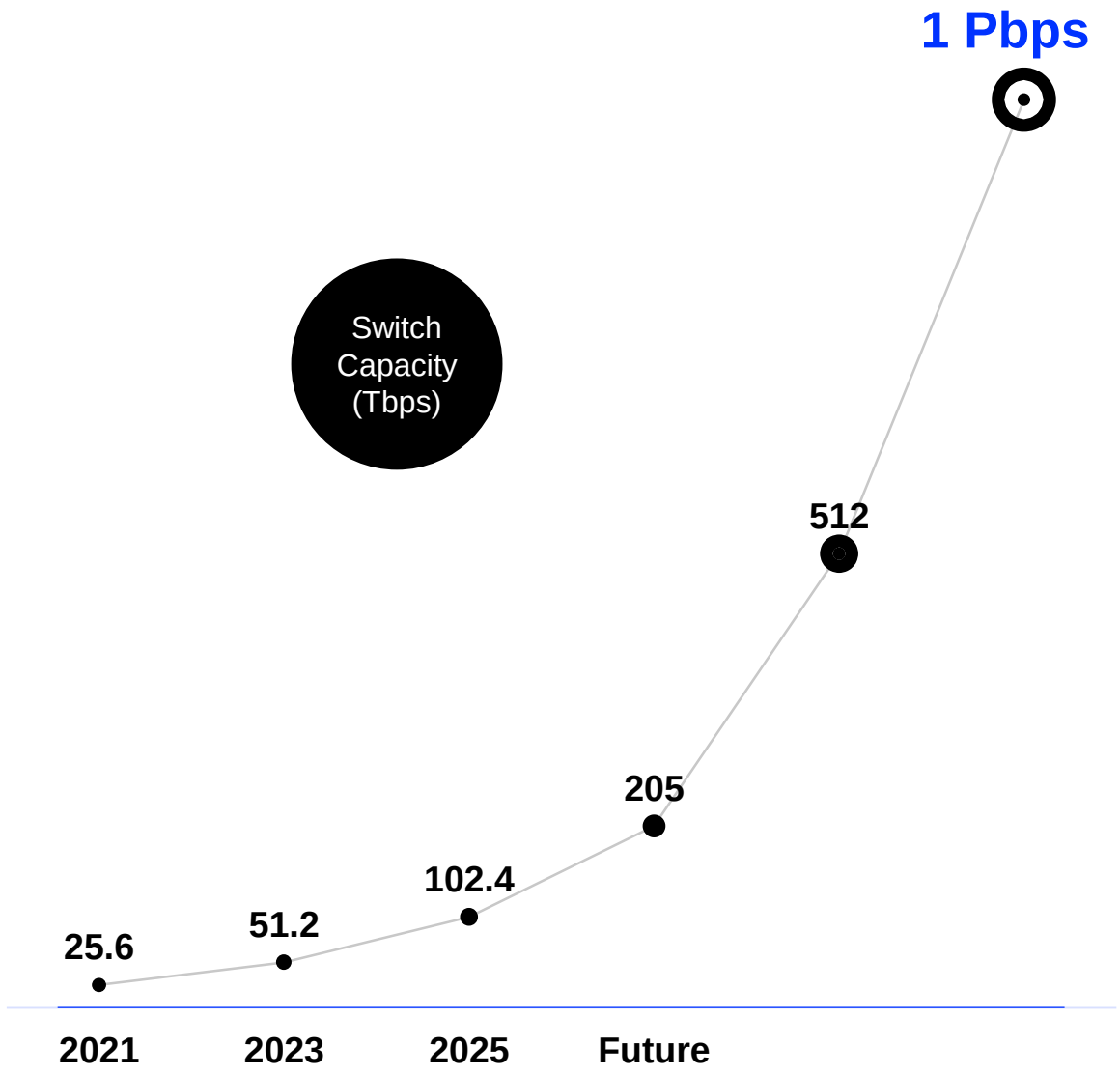
- System face plate space will not increase but switches will scale from 10T to >100T
- 1 Pbps requires 40000 optical connectors with transceivers at 100 Gbps and only 2500 connectors with transceivers at 1.6 Tbps

1 Pbps



100 Gbps
X
40,000

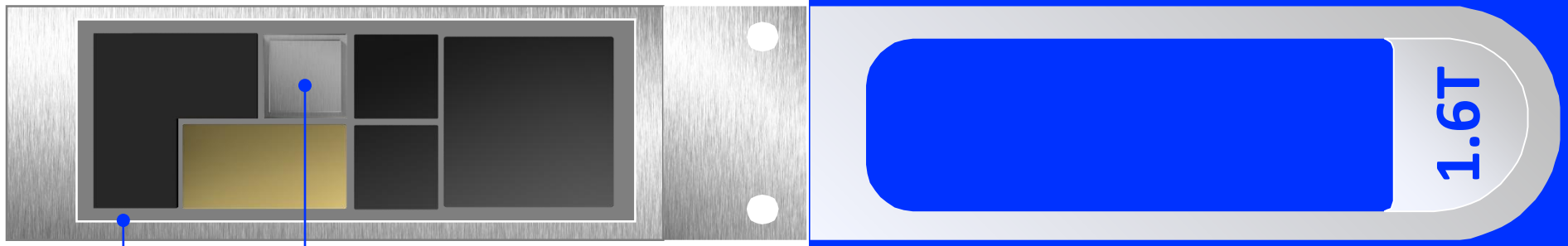
1.6 Tbps
X
2,500



MULTI-TERABIT COHERENT TRANSCEIVER TECHNOLOGY FOR THE SUSTAINABILITY OF FUTURE DATACENTERS

1.6 T

Transceiver



DSP from 7 nm CMOS to less than 3 nm

From printed circuit boards to multi-chip module level of integration

A 1.6T transceiver could consume as little as one-tenth the power of 16 older-generation transceivers at 100G.

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COHERENT TRANSMISSION: NOW, NEXT, AND BEYOND

NOW

Equipment disaggregation in telecom networks

400G+

NEXT

Coherent transceivers in access networks

100G

BEYOND

Terabit interfaces in datacenter networks

1.6T+

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DATACOM TRANSCEIVERS NOW, NEXT, AND BEYOND

Analyst briefing at OFC 2023

March 8, 2023

Dr. Julie Sheridan Eng
Chief Technology Officer

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DATACENTERS

A vast, sprawling, and rapidly growing information infrastructure is becoming increasingly woven into lives

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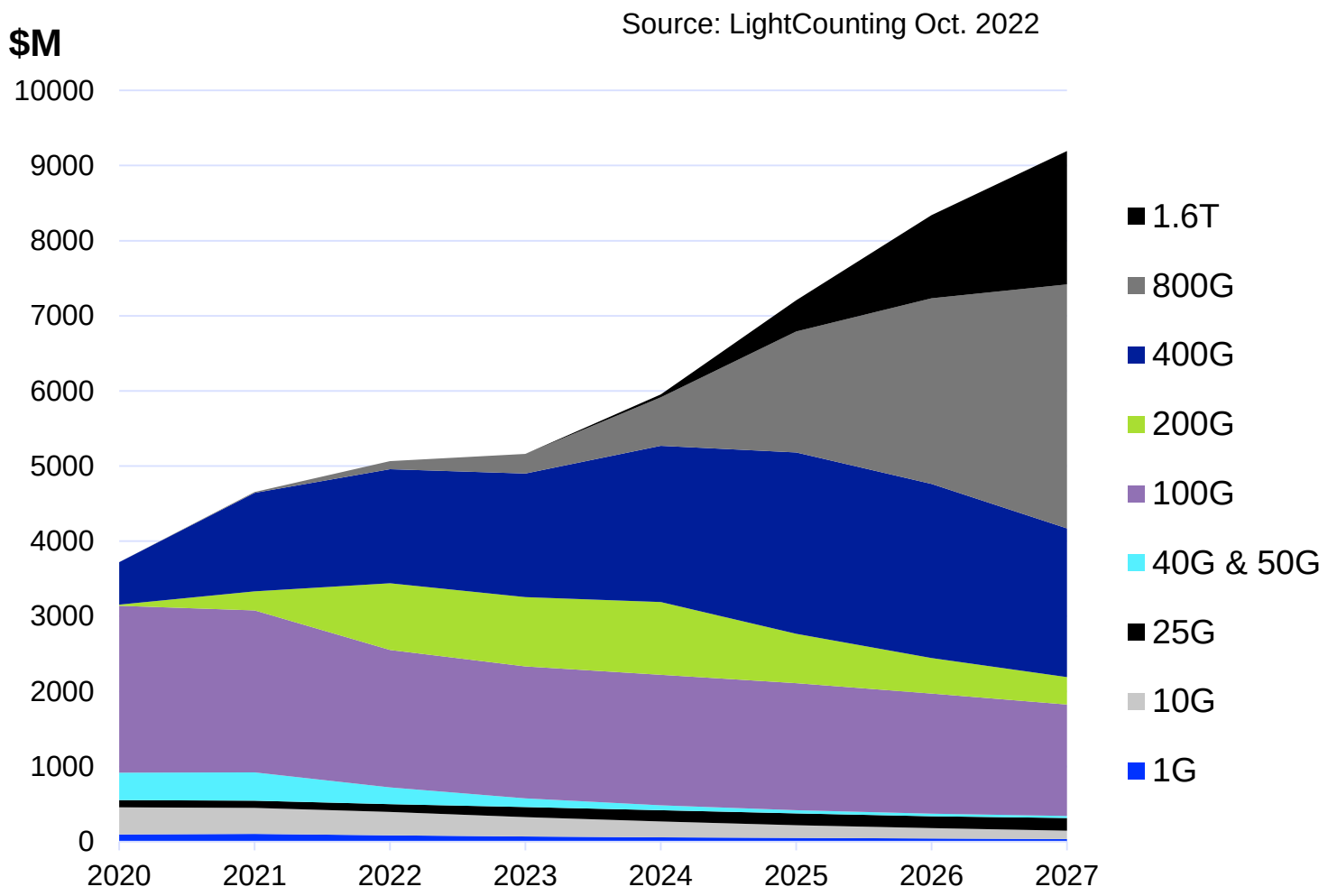
ETHERNET TRANSCEIVER GLOBAL MARKET



#1

in the datacom market
with $1.2 billion in sales

200G

and higher data-rate
transceivers
>50% of our revenue

800G

and higher data-rate
transceivers
50% of the total available
market by 2027*.

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TRANSFORMATIONS IN THE OPTICAL NETWORK NOW, NEXT, AND BEYOND

Now

100G Per Lane

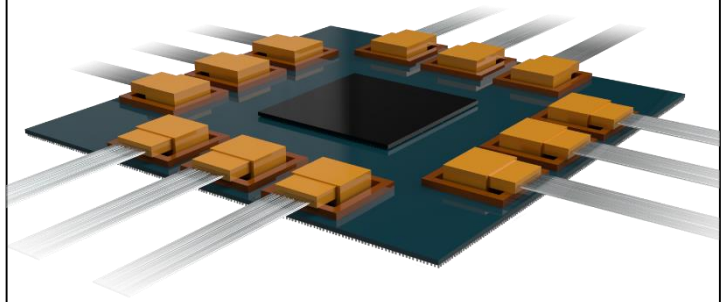
A full range of lasers and technology platforms enables market leadership

Next

1.6T Transceiver Technology

Market transition accelerated by AI and ML

Beyond



Co-Packaged Optics (CPO)

Addressing data bottlenecks beyond transceivers

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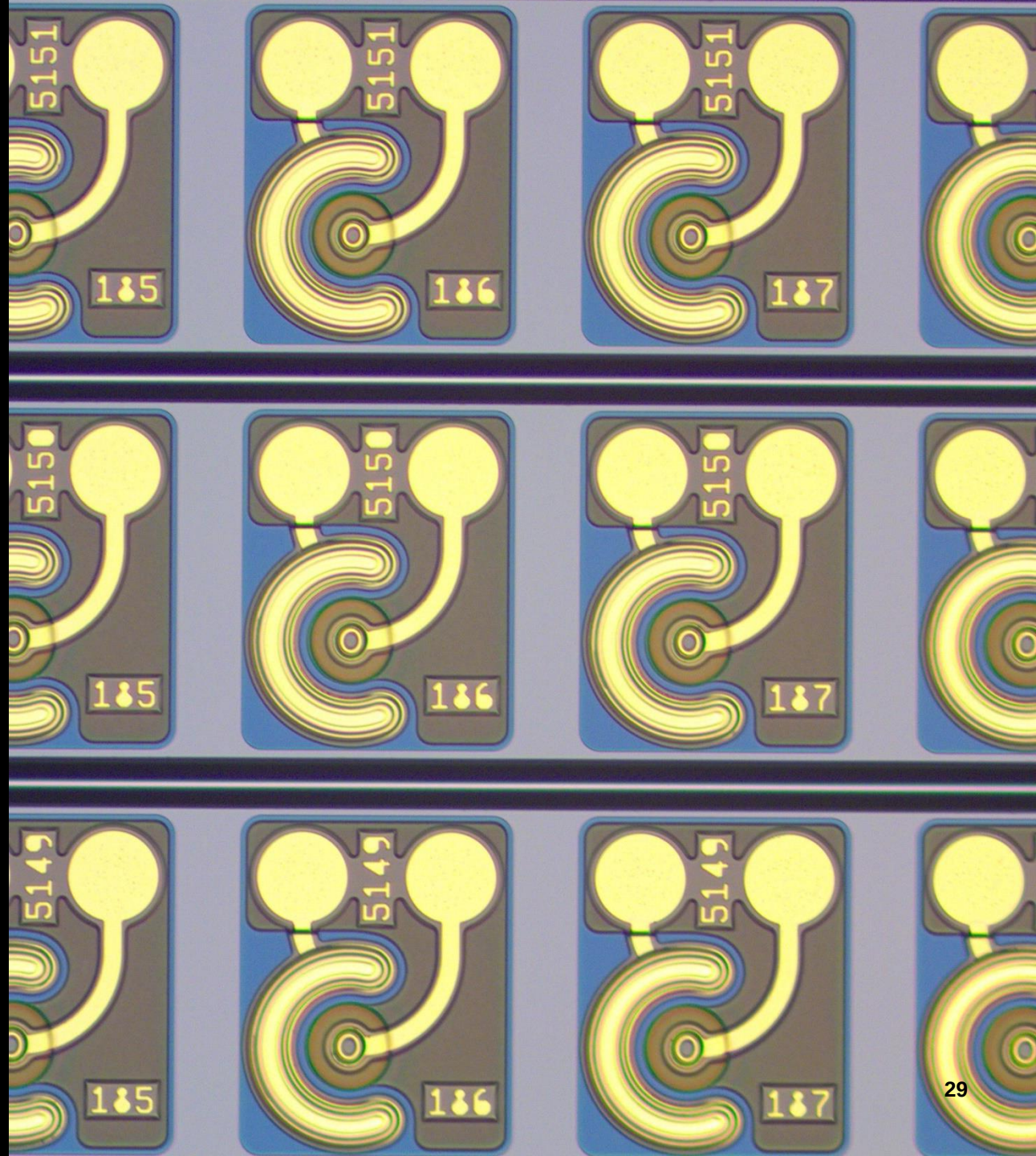
NOW

100G Per Lane



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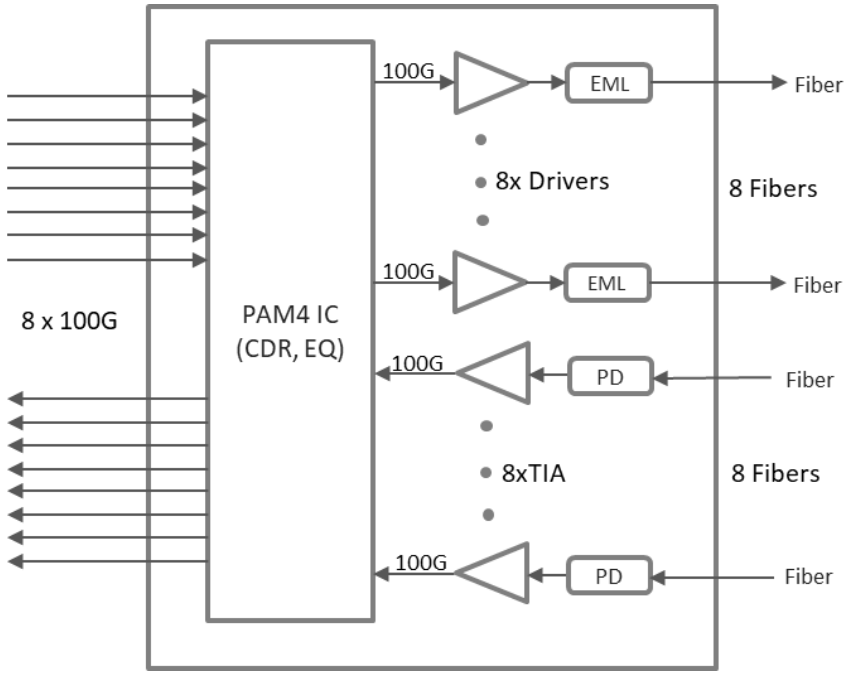
TRANSCEIVER DATA RATES ARE MULTIPLES OF LANE DATA RATES



MTP connector of a fiber ribbon cable

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GALLIUM ARSENIDE PLATFORM FOR SHORT-REACH TRANSCEIVERS

Feb. 2023 - Coherent introduces our 100G per lane VCSELs to support 400G and 800Gb transceivers

Vertically integrated 6” GaAs platform
Sherman, TX

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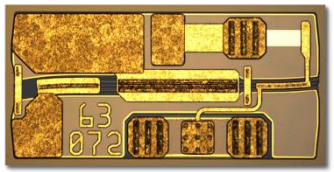
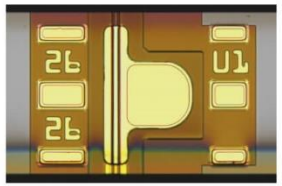
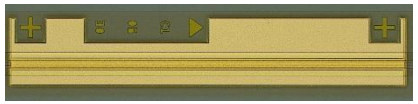
INDIUM PHOSPHIDE TECHNOLOGY PLATFORM FOR LONG-REACH TRANSCEIVERS



Electro-Absorption Modulated Laser (EML)

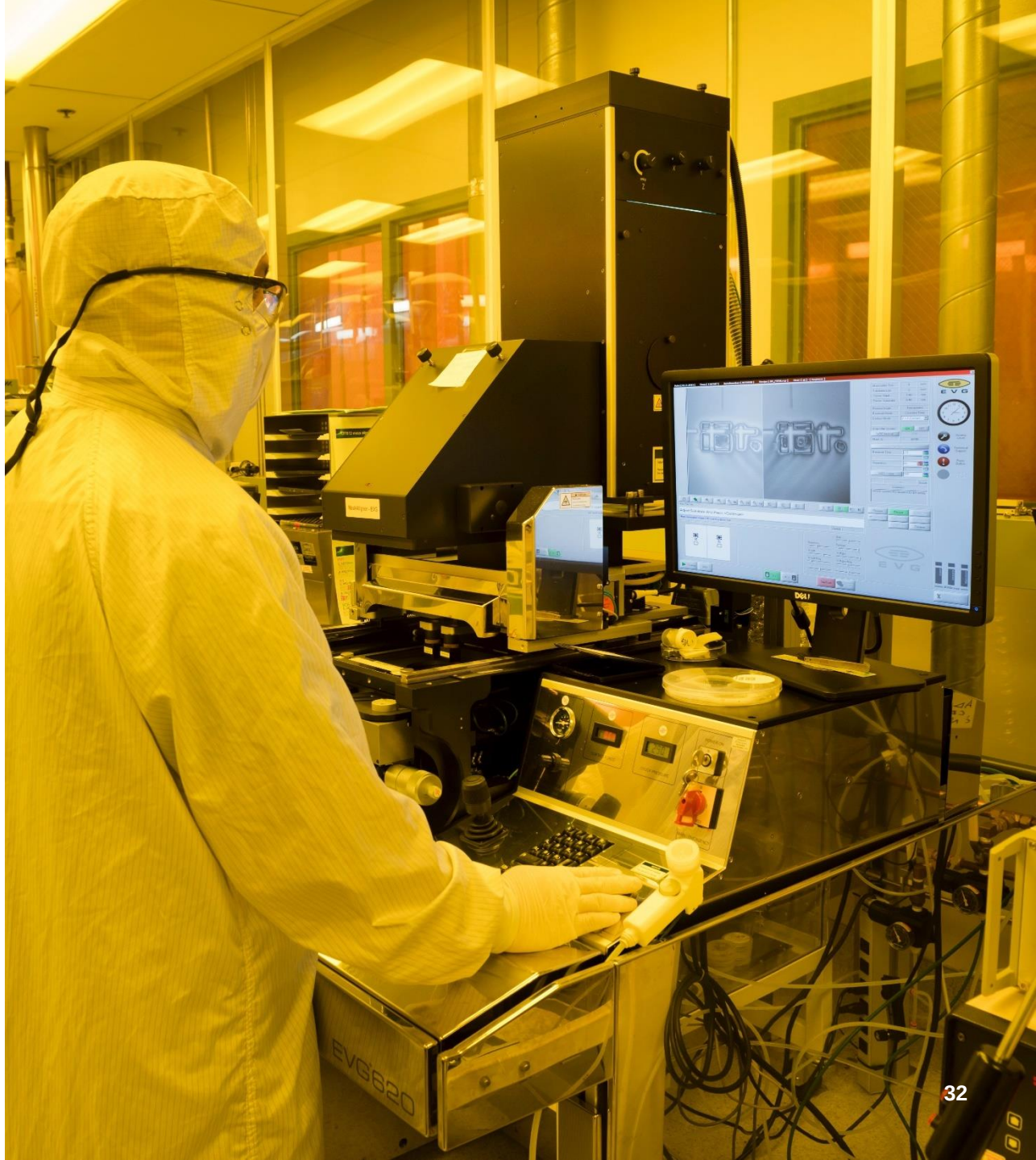


Directly Modulated Laser (DML)



Continuous Wave Laser (CWL)

Indium phosphide wafer fab in Fremont, CA



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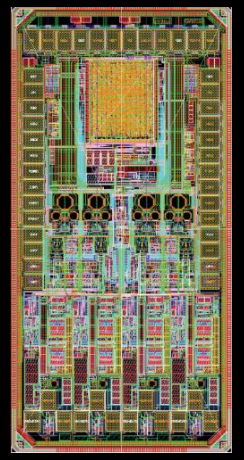
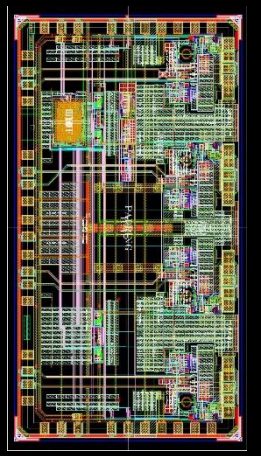
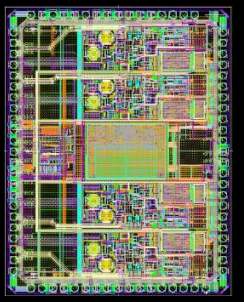
INTEGRATED CIRCUITS



Trans-impedance amplifier (TIA)



Laser driver



Clock data recovery (CDR)

- In-house integrated circuit design team for laser drivers, TIAs and CDRs
- ICs manufactured in tier 1 silicon foundries

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ASSEMBLY MANUFACTURING AT SCALE

Wuxi, China
1,530K sq. ft manufacturing space
5,000 employees

Ipoh, Malaysia
640K sq. ft manufacturing space
3,500 employees

Geographic diversity of high volume transceiver assembly manufacturing improves **assurances of supply**

Transceiver volume assembly manufacturing facility in Ipoh, Malaysia

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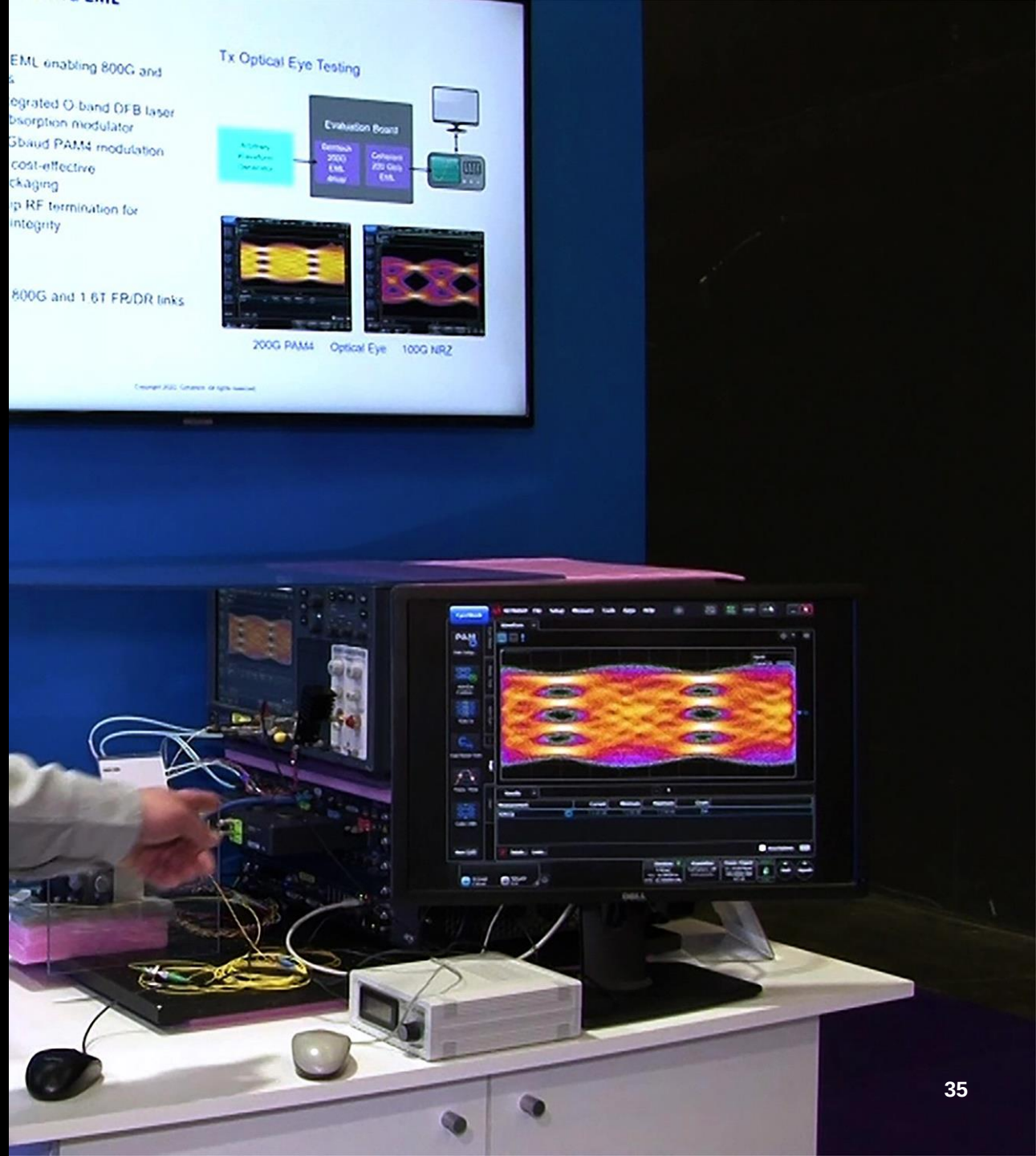
NEXT

1.6T Transceiver Technology



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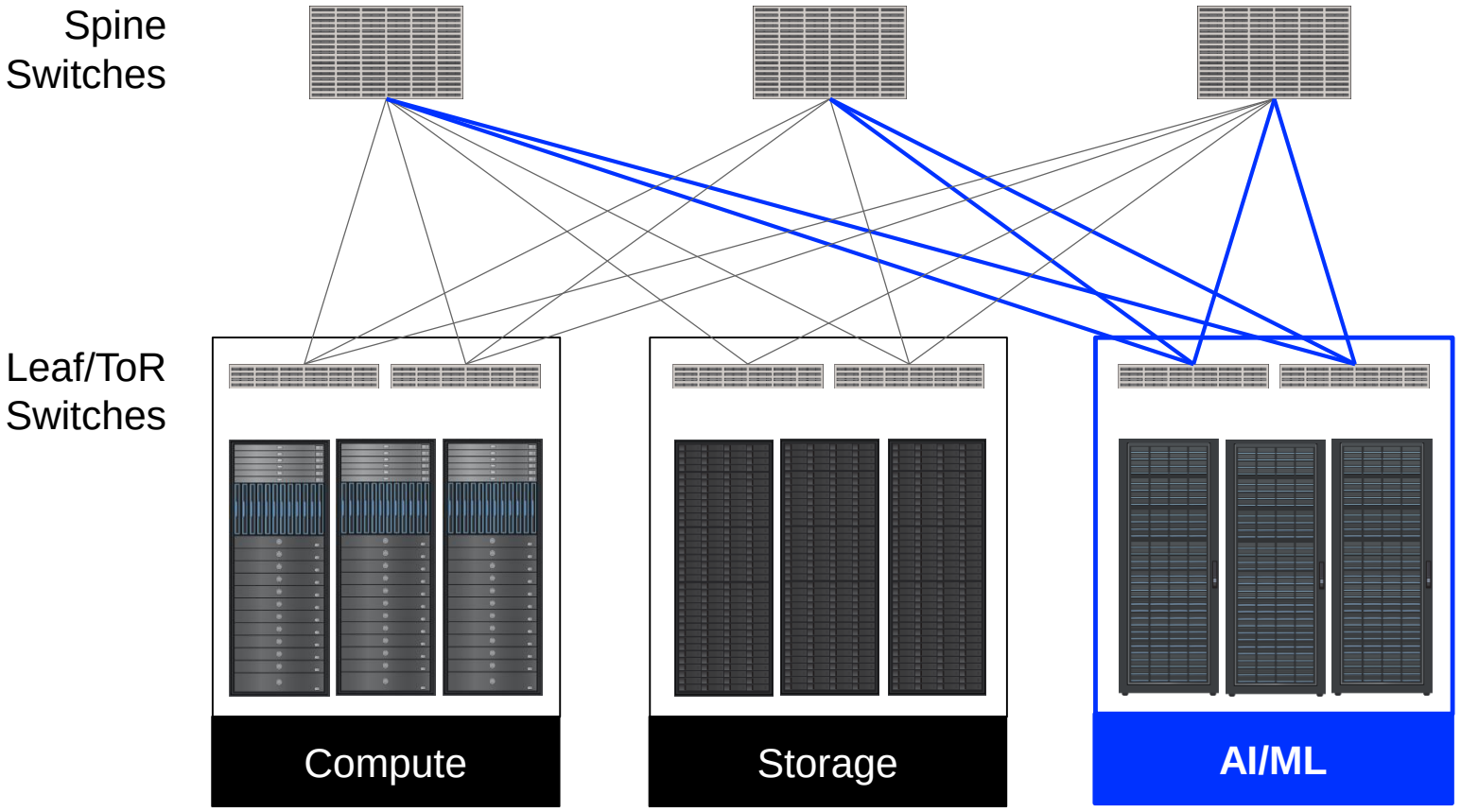
THE GROWING FOOTPRINT OF AI/ML IN DATA CENTERS



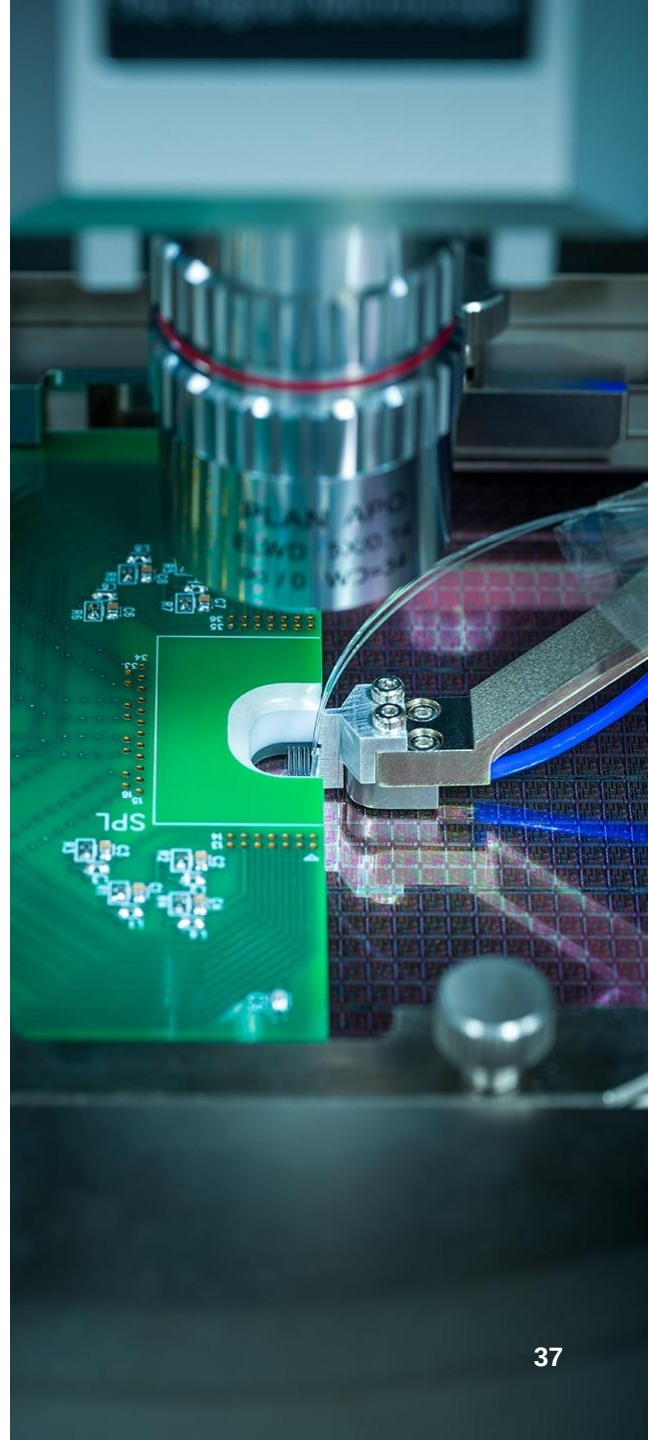
AI/ML

- A new datacenter network dedicated to AI/ML
- AI/ML link data rates expected to grow much faster than compute and storage

LASERS AND TRANSCEIVERS IN DEVELOPMENT FOR 1.6T

1.6T Short-Reach **< 300 m**	**1.6T** Mid-Reach **500 m to 2 km**	**1.6T** Long-Reach **Up to 10 km**
100G per lane 16 lanes Gallium Arsenide ▪ VCSEL	200G per lane 8 lanes Indium Phosphide ▪ DML ▪ EML ▪ CWL with modulator in Silicon Photonics	200G per lane 8 lanes Indium Phosphide ▪ EML ▪ DFB-MZ

VCSEL: Vertical Cavity Surface-Emitting Laser
DML: Directly Modulated Laser
EML: Electro-Absorption Modulated Laser
CWL: Continuous Wave Laser
DFB-MZ: Distributed Feedback Laser with Mach-Zehnder Modulator



Datacom transceiver R&D
in Fremont, CA

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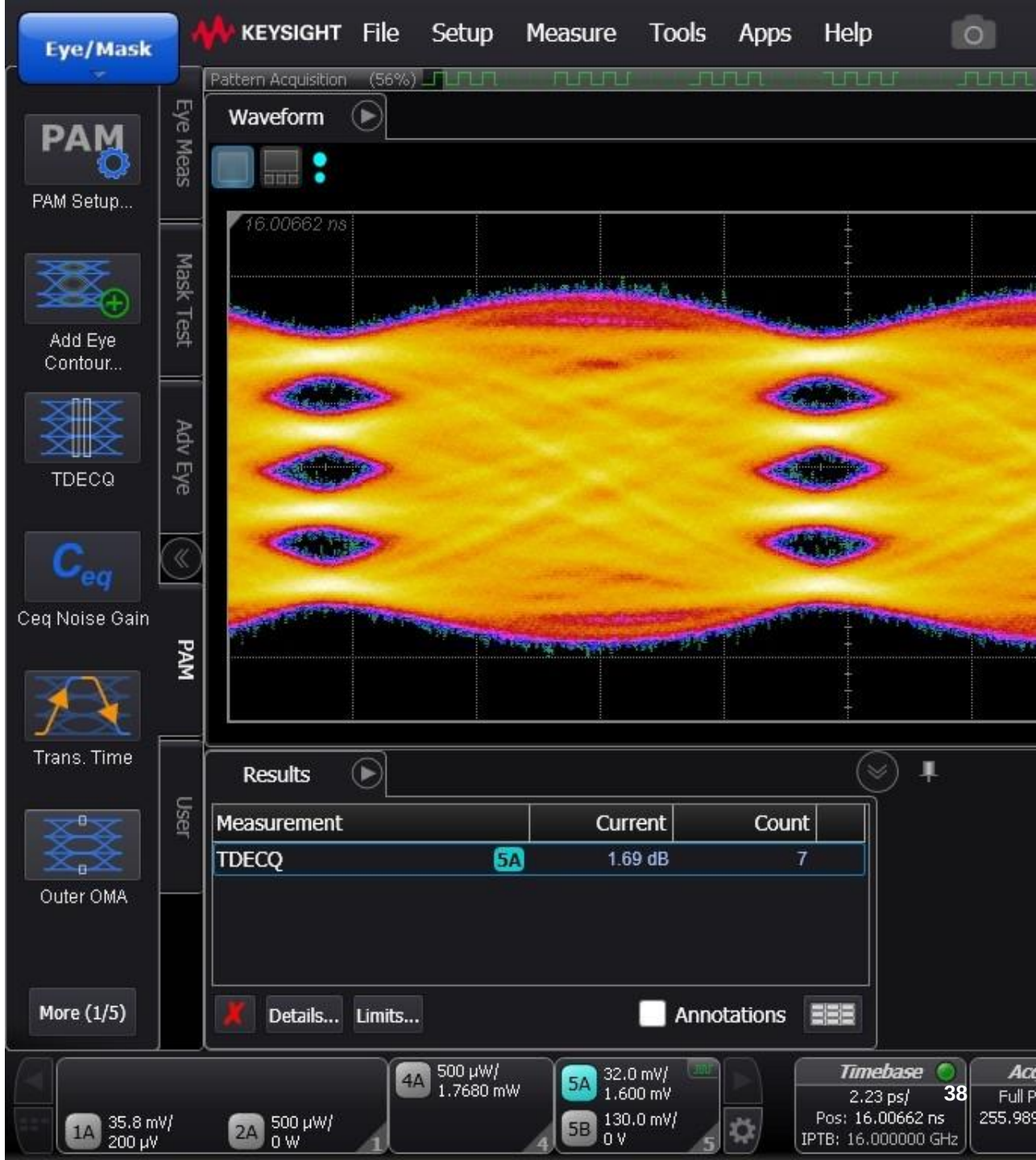
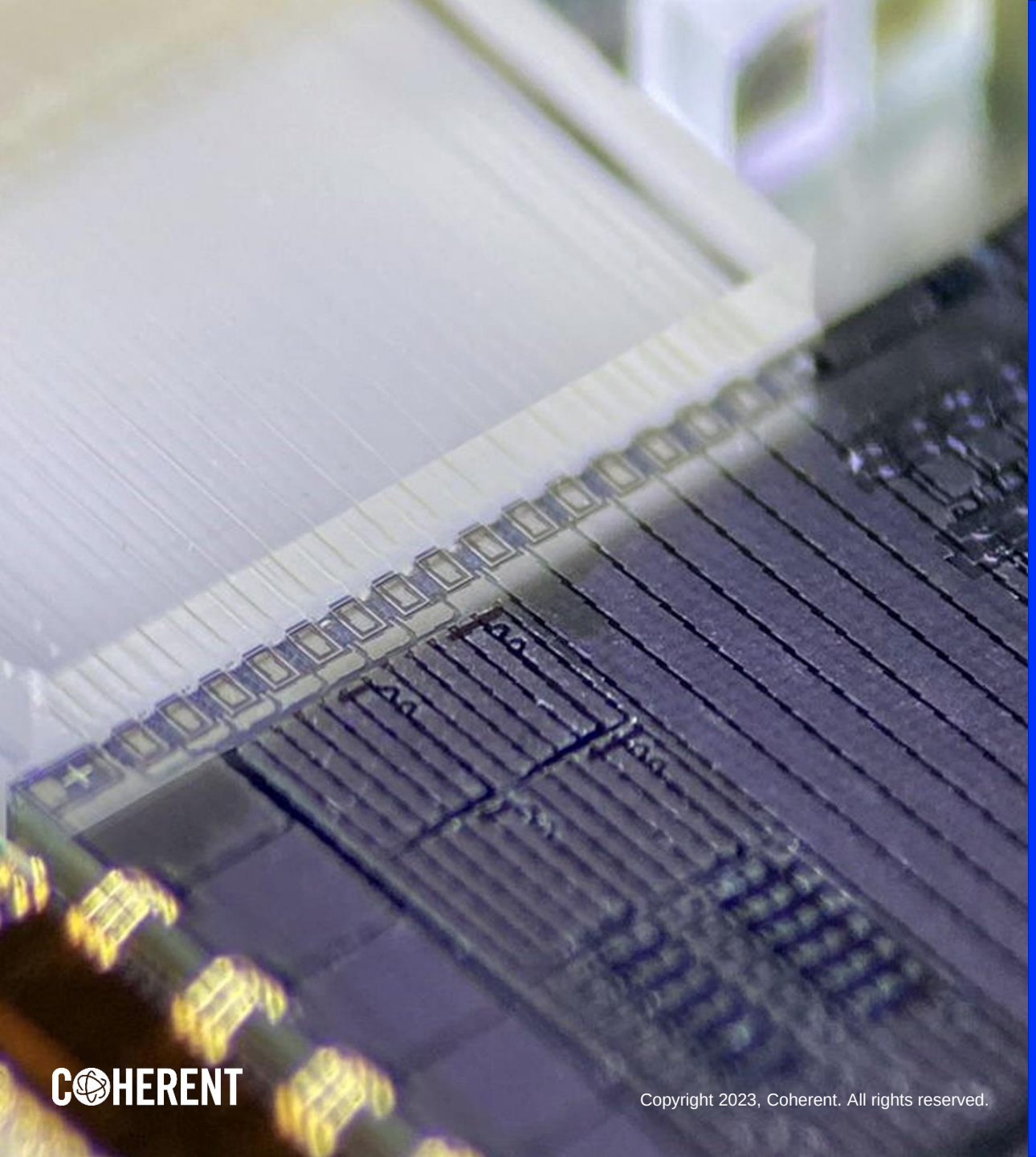
200G PAM4 MACH-ZEHNDER MODULATED LASER TECHNOLOGY

- Supports 1.6T, 10 km transceivers
- Uncooled operation for shorter links
- 200G PAM4 per wavelength
  - LAN-WDM, CWDM channel plans
- High performance:
  - High speed 112 Gbaud
  - High output power: 8.5 dBm
  - Extinction ratio: 7dB OMA
  - Low noise: -147 dB/Hz
  - Low TDECQ





BEYOND

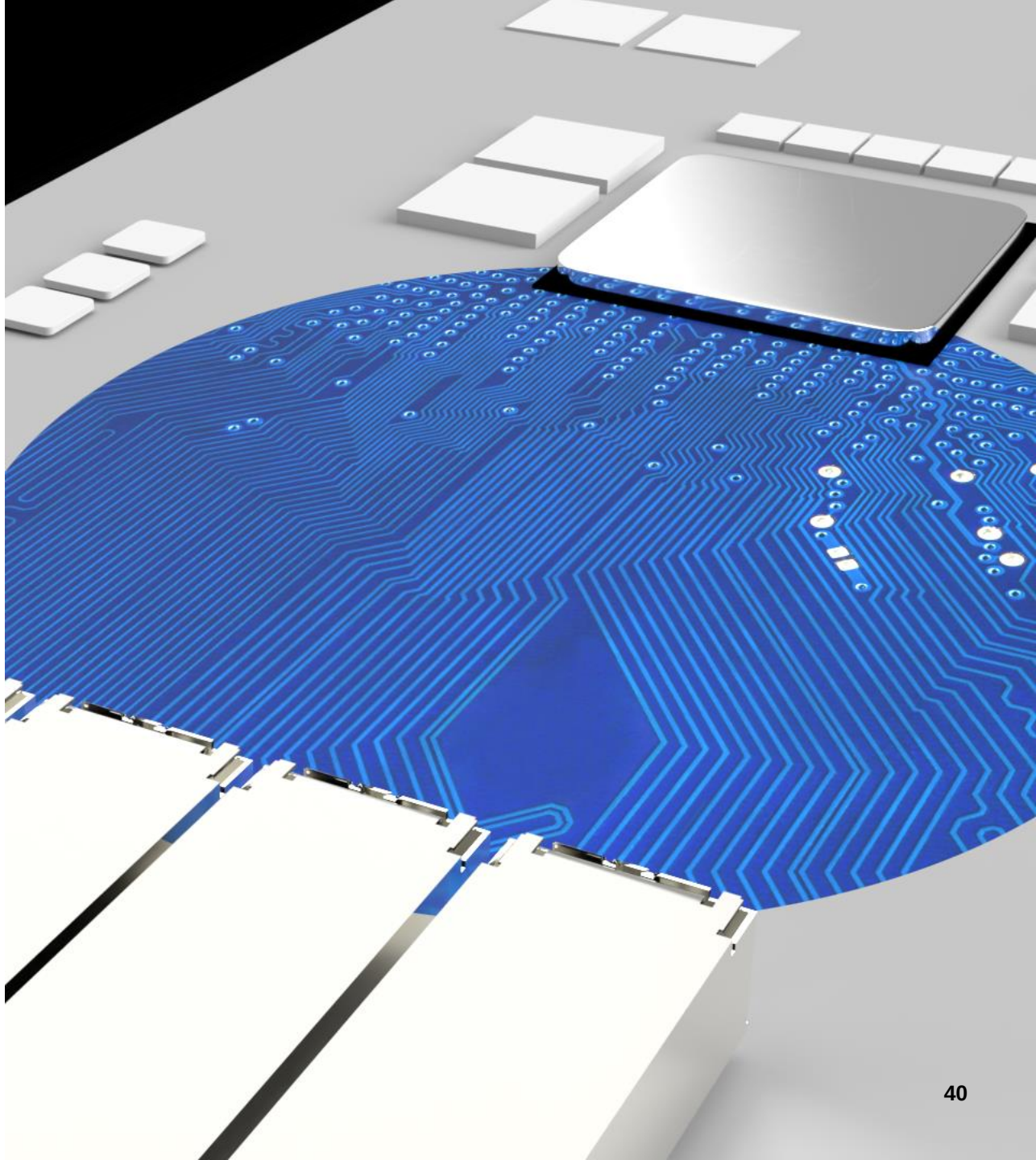
Co-Packaged Optics (CPO) Technology

COHERENT

DATA RATE BOTTLENECKS

As the bandwidth of switch chips increase, new bottlenecks for electrical signals emerge:

- In and out of the switch chip
- Across a printed circuit board to the transceiver
- Number of optical transceivers that can fit on the front face plate to support the full switch bandwidth



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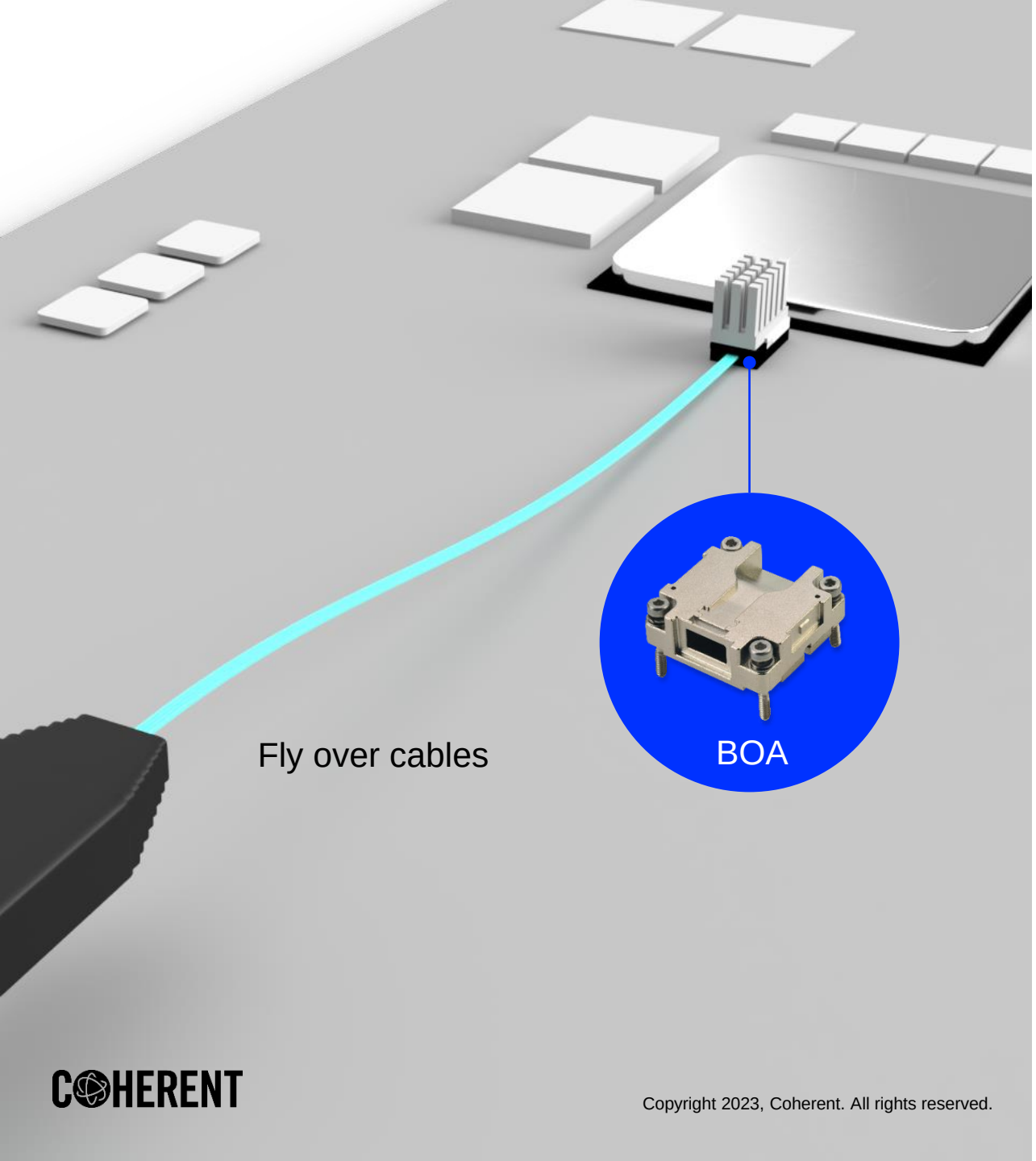

BOARD-MOUNTED OPTICAL ASSEMBLIES AND FLY OVER CABLES

BOA Board-Mounted Optical Assemblies	BOAs are vertically pluggable transceivers that sit right next to the switch chip but are not integrated with the switch chip.
Fly over cables	The cables run from directly next to a processor to the front panel above the printed circuit board

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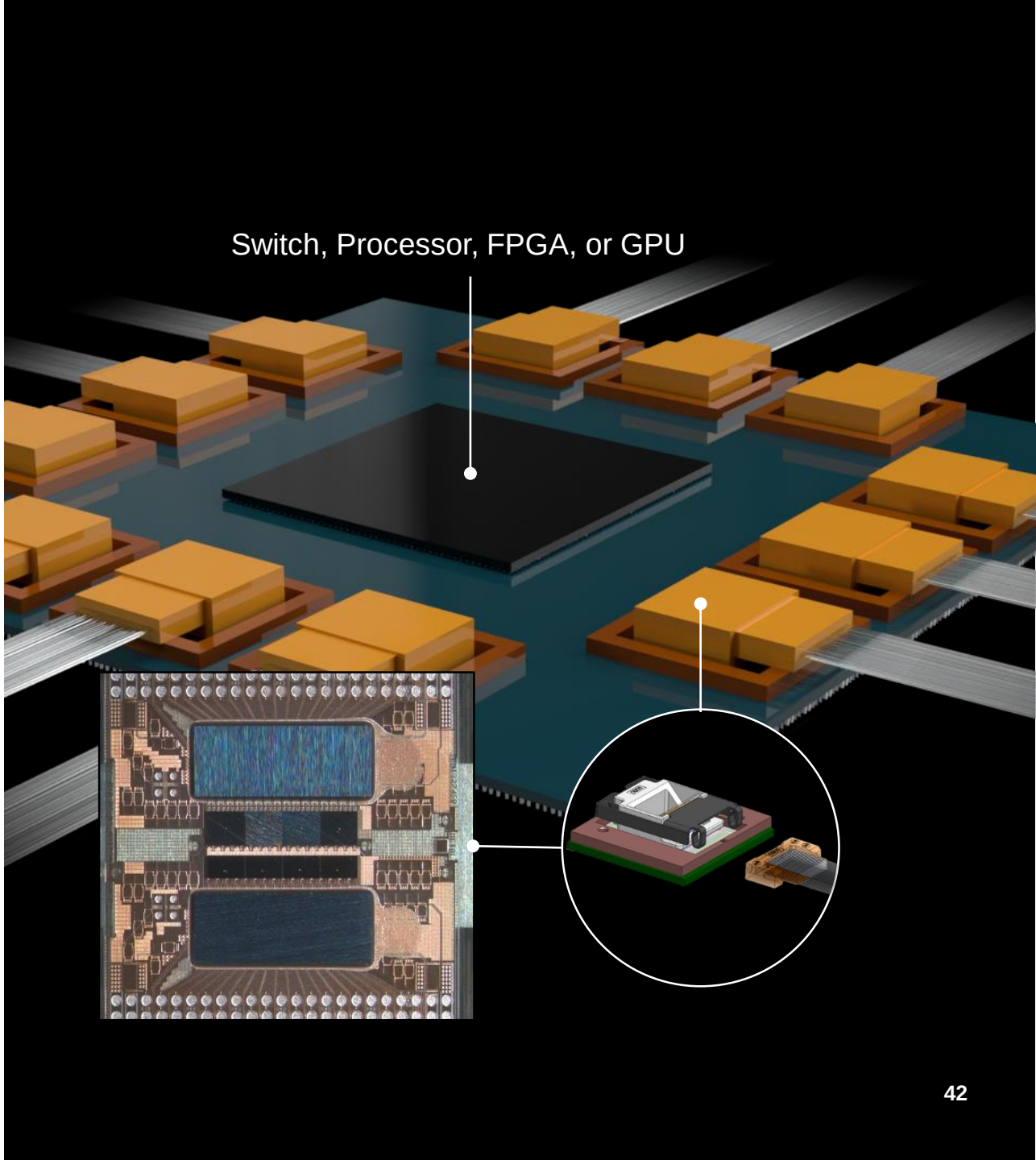
CO-PACKAGING TECHNOLOGY

arpa·e
CHANGING WHAT'S POSSIBLE

- ARPA-E Sponsored Project on co-packaging
- IBM and Coherent collaboration
- 940 nm VCSELs
- 800G – 50G/lane x 16 lanes
- < 4 pJ/bit, 3.2 W
- W: 13 mm x D: 13 mm x H: 4 mm



COHERENT

WHY THE INDUSTRY LOVES PLUGGABLE TRANSCEIVERS

- **Ecosystem of components and pluggable modules**
  - 1G, 10G, 25G, 40G, 100G, 200G, 400G, 800G
  - 100 m, 500 m, 2 km, 10 km, 40 km, 80 km
- **Standards-based**
- **“Pay-as-you-grow” cost model**
- **Easily replaceable**

Pluggable transceivers have been successful for these reasons for 25+ years, with hundreds of millions of units shipped

COHERENT

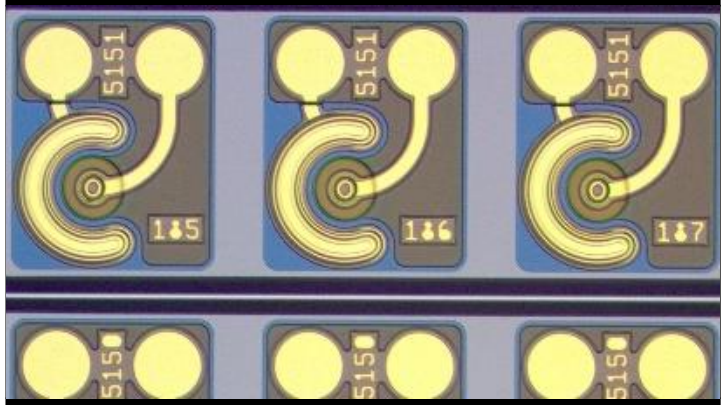
CHOOSING THE BEST TECHNOLOGY FOR THE APPLICATION

Short-Reach Inches to 300 m	**Mid-Reach** 500 m to 2 km	**Long-Reach** Up to 10 km
Gallium Arsenide VCSELs	Indium Phosphide Lasers & Detectors and Micro-Optic Assemblies	
	Indium Phosphide Lasers & Detectors on Silicon Photonics	Indium Phosphide Photonic Integrated Circuits (PIC)

Datacom transceiver R&D in Fremont, CA

TRANSFORMATIONS IN THE OPTICAL NETWORK NOW, NEXT, AND BEYOND

Now



100G Per Lane

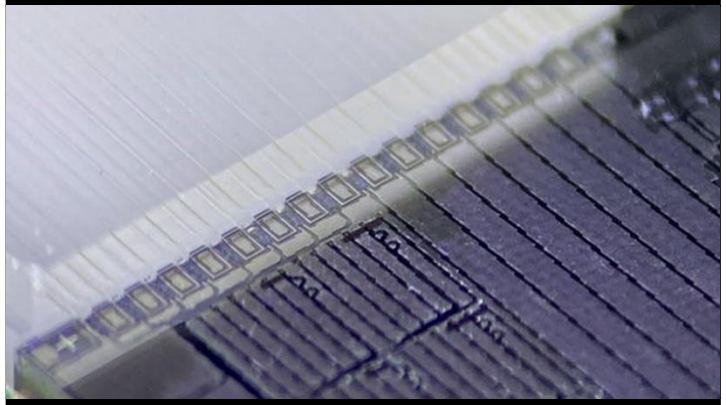
A full range of lasers and technology platforms enables market leadership

Next

1.6T Transceiver Technology

Market transition accelerated by AI and ML

Beyond



Co-Packaged Optics (CPO)

Addressing data bottlenecks beyond transceivers

COHERENT

Q&A

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Mary Jane Raymond
Chief Financial Officer

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Chief Technology Officer

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