

# The optical transceivers market will more than double by 2025 driven by heavy investments in data centers<sup>1</sup>

## OUTLINES:

- End of 2025, Yole Développement announces a US\$17.7 billion market, with a 15% CAGR<sup>2</sup> during this period.
- Market driver is the high optical module cost erosion coupled with high volume adoption of high data rates modules by big cloud service operators and national telecom operators.
- The optical transceiver industry is very fragmented and tightly linked with other optical communication technologies.
- Technology status:  
The integration of multiple technologies is the major technical trends identified by Yole Développement's analysts.  
Basically, three technology platforms - silicon photonics, InP, and VCSELs - are used in today's optical modules and are targeting different applications.  
Silicon photonics might represent a key enabling technology for future development.
- COVID-19 is affecting telecommunication globally. As a consequence, sales of optical transceiver modules will be negatively impacted in 2020.

*“Revenue generated by optical transceivers reached around US\$7.7 billion in 2019 and is expected to more than double to around US\$17.7 billion by 2025 at a CAGR for 2019-2025 of 15%” asserts **Martin Vallo, PhD, Technology & Market Analyst Solid-State Lighting technologies, within the Photonics, Sensing & Display division at Yole Développement (Yole)**. “This growth will be driven by high volume adoption of expensive high data rates including 400G and 800G, modules by big cloud service operators. Therefore, such players invest more and more in new datacenters and top of that telecom operators have also increased their investments into the 5G networks that use wireless optical transceivers”.*

**High demand from datacenter and telecom operators have been confirmed as follows:**

---

<sup>1</sup> Extracted from :

- [Optical Transceivers for Datacom & Telecom 2020 report](#), Yole Développement
- [Silicon Photonics 2020 report](#), Yole Développement
- [Intel Silicon Photonic 100G CWDM4 QFSP28 Transceiver](#), System Plus Consulting, 2020

<sup>2</sup> CAGR: Compound Annual Growth Rate

- The datacom market growth, about 20% CAGR between 2019 and 2025, will be driven by the adoption of expensive higher data rate optical modules which migrate from core/spine networks down to inter-rack connections.
- The revenue growth of telecom optical modules will be driven by coherent technologies for DCI optical transport solutions and 5G optical transceivers deployment in Asia. Yole's analysts announce 5% CAGR during this period.
- The sharp difference in growth revenues is caused by lower sales expectation in 2020 due to the COVID-19 pandemic.

In addition, the total revenue is expected to moderately increase in 2020 with the effect of the pandemic. Indeed, COVID-19 is naturally affecting telecommunications globally and sales of optical transceiver modules. However, demand for optical modules by data-center operators is very strong in China, pushed by the local government. Its strategy is mainly focused on the 5G deployment and the development of cloud data centers.

In this context, Yole and its partner System Plus Consulting deeply investigates the optical transceivers technologies and related markets. Today the photonics team delivers three dedicated reports to point out the latest innovations and underlines the business opportunities: Optical Transceivers for Datacom & Telecom 2020 report - Silicon Photonics 2020 report – Intel Silicon Photonic 100G CWDM4 QFSP28 Transceiver.

Released today, the Optical Transceivers for Datacom & Telecom 2020 report gives a deep understanding of the global landscape of fiber-optic communication and classifies its technologies for newcomers to this field. Analysts examine the application landscape, and associated technologies and propose a complete review of the optical transceiver industry and future trends. Including drivers of network traffic growth, macro trend analyses for both Datacom and Telecom, a review of trends in data centers impacting the optical module market, detailed ASP evolution, this report aims to reveal a detailed description of this industry.

What is the status of the optical transceivers industry? What are the main market and technical trends for both market segments, datacom and telecom? Who are the key suppliers to watch, and what technologies do they provide? What are the technical challenges? Yole presents today its vision of the optical transceivers industry.

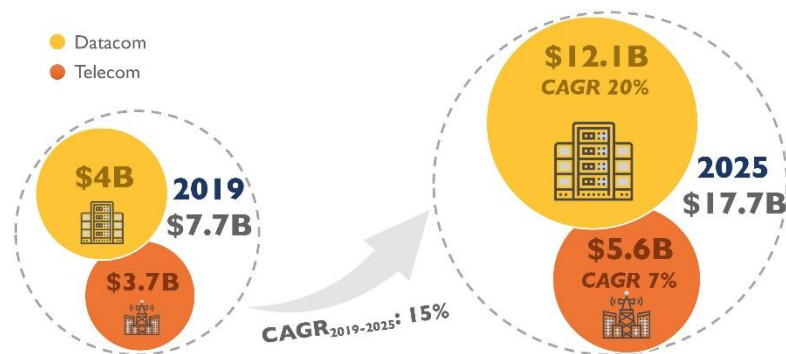
According to **Pars Mukish, Business Unit Manager, Solid-State Lighting (SSL) & Display at Yole**: *“The state of the art of fiber-optic communication technologies has advanced dramatically over the past 25 years. The highest capacity of commercial fiber-optic links available in the 1990s was only 2.5-10 Gb/s while today they can carry up to 800 Gb/s. The last decade of developments have enabled higher efficiency digital communication systems and solved problems with degraded signals”.*

Network traffic growth has been increasing at an enormous pace over the decades and across all the network architectures from the long-haul, mobile access to intra-DC networks. This

growth has been driven by streaming UHD<sup>3</sup> videos, which need ever higher data throughput, and now newly emerging digital applications and services requiring fast access to the digital networks. It appears that the success and demand for existing applications continuously drives scale and capacity of the underlying network infrastructure (including OTs) to points where further applications are enabled, renewing the cycle. Fiber optic networks consist of a set of optical network devices connected by optical fiber links, able to provide transport and related functionalities of optical channels carrying signals to final client. Datacom<sup>4</sup> is linked with cloud services in DCs<sup>5</sup> and often excludes voice services. Typical transmission distance is up to 100 km. Telecommunication is any communication over a distance, typically over 100 km. Telecom includes voice services, wireless networks as well as data communication. A transceiver gets its name from being both an optical transmitter that converts an electrical signal into a light signal, and an optical receiver that accepts the light signal and converts it back into an electrical signal. The OTs<sup>6</sup> are widely used in server network cards, switches, routers and wireless base station equipment in a variety of network architectures and applications. Distances covered start from less than 50 meters for server and storage interconnections in data centers and enterprise networks to more than 800 km in telecom networks.

### 2019-2025 optical transceiver market revenue forecast by application

(Source: Optical Transceivers for Datacom & Telecom 2020 report, Yole Développement, 2020)



As analyzed by Yole’s team in the new Optical Transceivers for Datacom & Telecom 2020 report, the evolution of multiple technologies has enabled transmission speed of 400G and beyond in long haul and metro networks. Today’s trend of migration to 400G speeds stem from cloud operators’ demand to interconnect data centers. Furthermore, exponential increase of capacity of digital communication networks and growing numbers of optical ports

<sup>3</sup> UHD : Ultra High Definition  
<sup>4</sup> Datacom : Data Communication  
<sup>5</sup> DC : Data Centers  
<sup>6</sup> OT : Optical Transceivers

impact optical module technology hugely. The new form factors are increasingly universal and designed to reduce their size and thus power consumption. Inside modules the optics and integrated circuits are getting closer together.

Therefore, silicon photonics might represent a key enabling technology for further development of optical interconnect solutions needed to address growing traffic. This technology will play an important role in 500m–80km distance applications. Industry is working on heterogeneous integration of InP lasers directly onto silicon chips. The advantage is scalable integration and elimination of the cost and complexity of the optical package. Reduced efficiency and lower optical power at high temperature are the typical challenges for these lasers.

**For Eric Mounier, PhD, Fellow Analyst at Yole:** *“Besides increasing speed by integrating amplifiers, the higher data throughput is also achieved by integrating state-of-the-art digital signal processing chips providing different multi-level modulation techniques such as PAM4 or QAM. Another technique to increase data rates is parallelization or multiplexing that enables increasing capacity using parallel fibers or different wavelengths onto a single fiber”.*

Progress in integration of optical component technologies has led to dramatic reductions in complexity and cost of optical transceivers. The massive growth in bandwidth has yielded a 10 to 100-fold decrease in cost per transmitted bit.



*All year long, System Plus Consulting and Yole Développement combine their expertise and deep understanding of the markets and disruptive technologies to publish numerous reports. In addition, our experts realize various key presentations and organize key conferences.*

*Save the date right now: Optical Transceivers & Silicon Photonics Forum 2020 on September 9 at 1PM, in Shenzhen, China, alongside the 22nd CIOE.*

*This Forum is the first conference focused on optical transceivers and silicon photonics. Therefore, Yole is proud to collaborate with the China International Optoelectronic Expo (CIOE) to organize an all-new Executive Forum on Optical Transceivers and Silicon Photonics. This event will explore optical transceiver applications within the optical communication industry. Discover the program on i-Micronews and well as the overall 2020 program.*

*Throughout the year, Yole Développement publishes numerous photonic-related reports including the optical transceiver and the silicon photonics ones. Make sure to be aware of the latest news coming from the industry and get an overview of our activities, including interviews with leading companies and more on i-Micronews. Stay tuned!*

### Press contacts

**Sandrine Leroy**, Director, Public Relations, [leroy@yole.fr](mailto:leroy@yole.fr)

**Marion Barrier**, Assistant, Public Relations, [marion.barrier@yole.fr](mailto:marion.barrier@yole.fr)

Le Quartz, 75 Cours Emile Zola – 69100 Villeurbanne – Lyon –France – +33472830189

[www.yole.fr](http://www.yole.fr)- [www.i-micronews.com](http://www.i-micronews.com)- [LinkedIn](#) – [Twitter](#)

### About our analysts

**Martin Vallo, PhD** is serves as a Technology & Market Analyst specialized in solid-state lighting technologies, within the Photonics, Sensing & Display division at Yole Développement (Yole). With 9 years' experience within semiconductor technology, Martin is involved today in the development of technology & market reports as well as the production of custom consulting projects at Yole. Prior his mission at Yole, he worked at CEA (Grenoble, France), with a mission focused on the epitaxial growth of InGaN/GaN core-shell nanowire LEDs by MOCVD and their characterization for highly flexible photonic devices. Martin graduated from Academy of Sciences, Institute of Electrical Engineering (Slovakia) with an engineering degree in III-nitride semiconductors.

**Pars Mukish** serves as a Business Unit Manager, Solid-State Lighting (SSL) & Display at Yole Développement (Yole). Pars' mission is dedicated to the development of SSL and Display activities (ie laser diode, LED and OLED). Pars actively assists and supports the development of strategic projects, working with leading customers of the company. He manages the on-going expansion of technical and market expertise of the SSL & Display team. This team interacts daily with leading companies of the industry, allowing analysts to collect a large amount of data and integrate their understanding of the evolution of the market with technology breakthroughs. Pars is also regularly involved in international conferences, giving presentations and delivering keynotes. Prior to Yole, Pars has worked as Marketing Analyst and Techno-Economic Analyst for several years at the CEA (French Research Center). Pars holds a master's in Materials Science & Polymers (ITECH - France) and a master's in Innovation & Technology Management (EM Lyon - France).

With more than 25+ years of experience within the semiconductor industry, **Eric Mounier, PhD.** is Fellow Analyst at Yole Développement (Yole). Eric is daily providing deep insights into current and future semiconductor markets and innovative technologies such as Silicon photonics, MEMS, quantum computing and new type of sensors. Based on a relevant methodology expertise and strong technological background, he is closely working with the overall teams at Yole to point out disruptive technologies and analyze business opportunities. Eric Mounier has a Semiconductor Engineering Degree and a Ph.-D in Optoelectronics from the National Polytechnic Institute of Grenoble (France).

As well as:

**Alexis Debray, PhD** is a Technology & Market Analyst, Optoelectronics at Yole Développement (Yole). As a member of the Photonics, Sensing & Display division, Alexis is today engaged in the development of technology & market reports as well as the production of custom consulting projects dedicated to the imaging industry. Alexis is the author of various scientific publications and patents. He graduated from ENSICAEN and holds a PhD in applied acoustics.

**Sylvain Hallereau** has been Project Manager at System Plus Consulting since 2000. He is in charge of costing analyses for Integrated Circuits, Power semiconductors and LEDs. He has significant experience in the modeling of manufacturing costs for electronics components.

**Nicolas Radufe** is in charge of physical analysis at System Plus Consulting. He has a deep knowledge in chemical and physical analyses. He previously worked in microelectronics R&D for CEA/LETI in Grenoble and for STMicroelectronics in Crolles.

### About the reports

#### **Optical Transceivers for Datacom & Telecom 2020**

*Market will more than double by 2025 driven by heavy investments in data centers – Performed by Yole Développement*

#### **Companies cited:**

Acacia Communication, Accelink, Adtran, ADVA, Alibaba, Amazon Web services, Apple, Applied optoelectronics Inc (AOI), Arista, ATOP, AZ by CyrusOne, Baidu , Broadcom, ChampionONE, Ciena (Cyan), Cisco, ColorChip, Dell, E.C.I. Networks, Ekinops, Emcore, Eoptolink, Facebook, Fiberhome, Finisar (now II-VI), Foxconn Interconnect Technology (FOIT), Fujitsu Networks, Fujitsu Optical components, Gigalight, Google, HG Genuine Optics, Hisense Broadband, Huawei, Huawei, HUBER+SUHNER Cube Optics AG, IBM+Softlayer cloud services , II-VI, Infinera (Coriant, Transmode), InnoLight, Inphi, Intel, IPG Photonics (Menara Network), J.P. Morgan,

Juniper Networks, Lumentum, Macom, Mellanox, Microsoft, NEC, NeoPhotonics, Nokia (Alcatel Lucent), NTT Electronics, Oclaro, OE Solutions, Oplink (MOLEX), Padtec, Rackspace, Ranovus, Renesas (Integrated Device Technology), Rockley Photonics, Sicoya, Skorprios technologies, Source Photonics, ST, Sumitomo, Tencent, Verizon , Xtera, Yahoo, ZTE and many more...

In addition :

**Intel Silicon Photonic 100G CWDM4 QFSP28 Transceiver**

*A deep analysis of the world's first 100G CWDM silicon photonic transceiver, covering new technologies and the main differences from the Intel 100G PSM4. - Performed by System Plus Consulting*

**Silicon Photonics Market & Technology 2020**

*Pluggable transceivers in high volume production. Co-packaged optics in line of sight. - Performed by Yole Développement - This report has been developed in collaboration with Jean-Louis Malinge.*

**Related reports:**

- [VCSELs – Market and Technology Trends 2019](#)
- [Edge Emitting Lasers: Market and Technology Trends 2019](#)
- [InP Wafer and Epiwafer Market – Photonic and RF Applications](#)
- [GaAs Wafer and Epiwafer Market: RF, Photonics, LED, Display and PV Applications 2020](#)
- [Intel Silicon Photonic 100G PSM4 QFSP28 Transceiver](#)

**About System Plus Consulting**

System Plus Consulting specializes in the cost analysis of electronics, from semiconductor devices to electronic systems. Created more than 20 years ago, System Plus Consulting has developed a complete range of services, costing tools and reports to deliver in-depth production cost studies and estimate the objective selling price of a product... [More](#)

**About Yole Développement**

Founded in 1998, Yole Développement (Yole) has grown to become a group of companies providing marketing, technology and strategy consulting, media and corporate finance services, reverse engineering and reverse costing services and well as IP and patent analysis. With a strong focus on emerging applications using silicon and/or micro manufacturing, the Yole group of companies has expanded to include more than 80 collaborators worldwide... [More](#)

**For more information and images, please visit [i-Micronews.com](http://i-Micronews.com)**

**###**