

# With more than US\$5 billion in 2026, the InP bare die market is offering opportunities and profits<sup>1</sup>

*Yole Développement (Yole) identifies new applications in a dynamic market bringing growth and opportunities for lots of companies...*

## OUTLINE:

- Market forecasts by applications:  
Growth in datacom & telecom applications will drive the InP<sup>2</sup> market in the next 5 years. CAGR between 2020 and 2026 are respectively 22% and 7%.  
Emerging InP applications such as LiDAR for automotive, 3D sensing and wearables are showing impressive CAGR: 210%, 467%<sup>3</sup> and 112%<sup>4</sup> respectively.
- Technology trends:  
The main technology used today in optical communication applications is DFB<sup>5</sup> with more than 63% of the market share.  
InP EEL<sup>6</sup> process yields are still low, hampering economy-of-scale.  
The demand for transceivers with high transmission rates exceeding 400GBps will drive technology advancement in single lasers and integrated devices.
- Supply chain:  
II-VI and Lumentum are leading the InP bare-die market.  
LandMark continues to dominate the InP epiwafer market, with more than 60% of the open epiwafer market share.  
Sumitomo and AXT continue to lead the wafer market with more than 75% of combined market share.  
China has been investing heavily in optical infrastructure with a massive deployment of 5G transceivers.  
Due to US-China trade war and COVID 19 pandemic, many laser & photonics companies lost big customers...

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<sup>1</sup> Extracted from: InP Wafer, Epiwafer and Device Market 2021: Photonics and RF Applications report, Yole Développement, 2021

<sup>2</sup> InP: Indium Phosphide

<sup>3</sup> CAGR between 2024 and 2026

<sup>4</sup> CAGR between 2022 and 2026

<sup>5</sup> DFB: Distributed Feedback Lasers

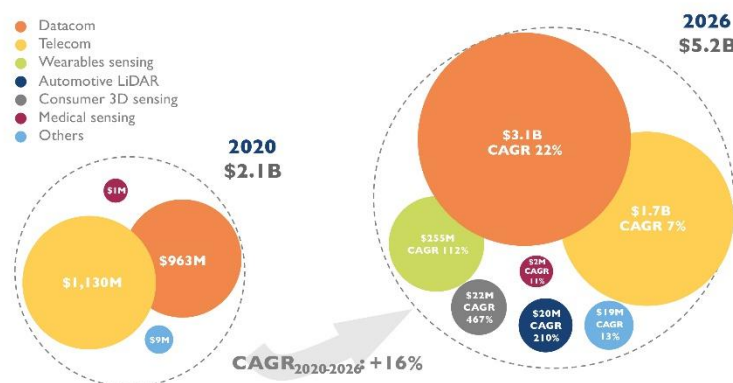
<sup>6</sup> EEL: Edge Emitting Laser

“At Yole, we expect an initial slight market penetration of InP in 2022 in wearables, followed by a significant increase to US\$255 million in 2026 with a CAGR<sub>2022-2026</sub> of 112%.” asserts **Ahmed Ben Slimane, PhD, Technology & Market Analyst, Compound Semiconductors and Emerging Substrates at Yole Développement (Yole)**. He adds: “For LiDAR applications, InP could be promising, enabling eye safety at higher wavelengths. Leading companies such as Volvo, ZF, Continental, Daimler, etc. are interested in adopting InP-based LiDAR<sup>7</sup>.”

For smartphones, OLED displays are transparent at wavelengths in the range of 13xx to 15xxnm, explains Yole’s analyst. OEM<sup>8</sup>s interested in removing the camera notch on mobile phone screens and integrating the 3D-sensing modules under OLED displays are considering moving to InP EELs, replacing the current GaAs<sup>9</sup> VCSELs. Even though this trend is currently in an early R&D phase, Yole sees a strong interest from several players, such as ams, Infineon Technologies, STMicroelectronics and several laser manufacturers and sensor players.

### 2020-2026 InP photonics bare-die market forecast, split by application

(Source: InP Wafer, Epiwafer and Device Market 2021: Photonics and RF Applications report, Yole Développement, 2021)



Consumer 3D sensing CAGR is calculated for 2024-2026  
Wearable sensing CAGR is calculated for 2022-2026

In this context, the market research and strategy consulting company investigates disruptive technologies and related markets in depth. Its aim is to point out the latest innovations and underline the business opportunities.

Released today, the [InP Wafer, Epiwafer and Device Market 2021: Photonics and RF Application report](#) delivers a comprehensive and detailed understanding of the InP industry, covering markets from wafers and epiwafers to bare dies.

Including market trends and forecasts, supply chain, technology trends, technical insights and challenges analysis, take away and outlook, this study proposes an in-depth description of the ecosystem and main players’ strategies.

<sup>7</sup> LiDAR: Light Detection and Ranging

<sup>8</sup> OEM: Original Equipment Manufacturer

<sup>9</sup> GaAs: Gallium Arsenide

What are the economic and technological challenges of this industry? What are the key market drivers? Who are the companies to watch, and what innovative technologies are they working on? What are the recent investments, mergers, and acquisitions?... Today, Yole’s compound semiconductor and emerging substrates analysts present their vision of the InP industry.

As analyzed by Yole’s team in the new InP Wafer, Epiwafer and Device Market 2021: Photonics and RF Application report, as an indispensable building block for high-speed and long-range optical transceivers, InP laser diodes remain the best choice for telecom & datacom photonic applications. However, following the COVID-19 outbreak and the US-China trade tensions, telecom infrastructure deployment was disrupted, resulting in a minor InP market slowdown in 2020.

The requirement for more data transfer at higher speed in datacom is increasing, with technology migrating to single InP lasers targeting state-of-the-art 100 Gbps output, making them preferable in 400Gbps and 800Gbps transceivers.

Driven by high volume adoption of high data rate lasers, the datacom bare die market reached around US\$963 million in 2020. It is expected to be worth US\$3.1 billion in 2026 at a 22% CAGR during this period.

Meanwhile, the cyclic InP telecom market will continue its growth thanks to 5G deployment. Yole sees a comfortable increase from US\$1.1 billion in 2020 to US\$1.7 billion in 2026 at a CAGR<sub>2020-2026</sub> of 7%.

### 2021’s InP industry landscape: Main players\* by market

(Source: InP Wafer, Epiwafer and Device Market 2021: Photonics and RF Applications report, Yole Développement, 2021)



The InP industry is a dynamic market with lots of opportunities for legacy players and new entrants. In its InP technology & market analysis, Yole reports a fragmented market, with numerous companies, especially at the device level.

According to **Ahmed Ben Slimane from Yole**: “Two American players are leading the InP market: II-VI and Lumentum. Both have increased their market share and strengthened their position

*thanks to strategic mergers and acquisitions. Indeed, II-VI acquired Finisar in 2019, and Lumentum acquired Oclaro in 2018.”*

II-VI and Lumentum have both vertically integrated business models: they generate revenues at bare die, device, and module-level. II-VI also offers epiwafer products. Their combined bare die market share is around 30%.

Facing II-VI and Lumentum, Yole identifies major Chinese players like Hisense and Accelink. Both companies are in the global top five and are increasing step by step their share of the market. The two Chinese companies take advantage of the US-China trade tensions and the massive 5G transceiver deployment in Asia, explain Yole’s analysts in the InP report.

Sensing applications targeting the mass consumer and automotive markets are attracting new players. Yole has identified several players interested in entering this market:

- Vertically integrated InP players with the know-how and an already established structure, as they can easily switch to sensing applications as soon as the market becomes bigger. II-VI and Lumentum are part of this segment.
- GaAs players with foundry capabilities could leverage the existing GaAs tools to switch to similar InP processes. Yole sees for example, ams and Trumpf.
- Emerging foundries or companies already working on InP-based solutions.

According to **Poshun Chiu, Technology & Market Analyst, Compound Semiconductors & Emerging Materials at Yole**: *“In the last category, we witnessed an increase in private investments and SPACs in the last year. These include, in Q4-2020, Luminar raised US\$590 million and went public, then acquired OptoGration; in Q2-2021, Aeva went public with an initial valuation of US\$1.7 billion; and in Q2-2021, Rockley Photonics announced its intention to go public at an initial valuation of US\$1.2 billion with an Apple supported project for smartwatches”.*

*All year long, Yole Développement publishes an impressive collection of compound semiconductors & emerging substrates reports and monitors. InP technology & market report is part of these activities.*

*Experts realize various key presentations, organize key conferences and interview leading industrial companies all year long. Their aim is to deliver key results and technology and market trends and explain the major changes.*

*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!*

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### About our analysts

**Ahmed Ben Slimane, PhD.** is a Technology & Market Analyst, specialized in Compound Semiconductors and Emerging Substrates at Yole Développement (Yole). As part of the Power & Wireless team, Ahmed is contributing to the development of dedicated collection of compound semiconductors market & technology reports and monitor. Previously, he worked as an epitaxy (MBE/MOCVD) & fabrication process engineer for GaAs-based photovoltaic applications at TOTAL and IPVF (Paris-Saclay, France). Ahmed also completed his PhD in Material Engineering from KAUST (Saudi Arabia), where his mission was focused on GaN-based microstructures for flexible solid-state lighting. During his career, Ahmed has presented his work in front of an international audience.. He authored/co-authored more than 20 publications in the semiconductor field and submitted a patent on the III-V hetero-structure for PV industry. Ahmed obtained his master's degree in Electronics Engineering from INPG (Grenoble, FR).

**Poshun Chiu** is a Technology & Market Analyst specializing in Compound Semiconductor and Emerging Substrates at Yole Développement (Yole). As a member of the Power Electronics & Wireless division at Yole, Poshun focuses on power, RF, and opto-electronics. He is engaged in the development of technology and market reports and is also involved in custom projects. Before joining Yole, Poshun had 9 years' experience in R&D and product management at Epistar (TW & CHN). He is the author or co-author of more than 10 patents in solid-state-lighting. Poshun was also engaged in the development and evaluation of novel applications of process technology and components based on relevant semiconductor material systems Poshun received an MSc degree in Microelectronics from National Cheng Kung University (TW) and an MBA from IESEG School of Business (FR).

### About the report

#### **InP Wafer, Epiwafer and Device Market 2021: Photonics and RF Applications**

*With a potential InP market of \$5.2B in 2026, ever-more companies are trying to take part.* – Performed by Yole Développement

#### **Companies cited:**

Acacia, Accelink, Aixtron, Amazon, Apple, Alibaba, AOI, AXT, Broadcom, Cengol, Ciena, Cisco, Coherent, Daimler, Denselight, DXT Shenzhen, Duet Microelectronics, Elbana, Ericsson, Emcore, Epic, Facebook, FBH, Finisar, GCS, Google, Hamamatsu, Hisense Broadband, Huawei, II-VI, Imec, Infinera, Innolight, Intel, IntelliEPI, IQE, InPact, InPhi, JX Nippon, Keysight, LandMark, Low Noise Factory, Luminar, Lumentum, Macom, Masimo, Microsoft, Mitsubishi Electric, MindSemi, Modulight, and more...

#### **Related reports:**

- [Optical Transceivers for Datacom & Telecom Market 2021](#)
- [3D Imaging and Sensing – Technology and Market Trends 2021](#)
- [Silicon Photonics 2021](#)
- [II-VI/Finisar 100Gb CWDM4 Optical Transceiver](#)
- [Intel Silicon Photonic 100G CWDM4 QFSP28 Transceiver](#)

### 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](#)

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